

UNITED STATES AIR FORCE ARMSTRONG LABORATORY

NOISENET: A Noise Monitoring and Noise Data Management System for Airbases

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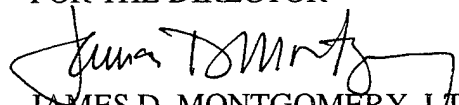
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FOR THE DIRECTOR


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| 13. ABSTRACT (Maximum 200 words) This report documents the functional specifications and operational procedures for the NOISENET noise data management system. NOISENET consists of a network of semi-permanent noise monitors linked by a central desktop computer running interactive control software written for the Microsoft Windows software environment. The NOISENET system software is responsible for coordinating the acquisition, storage, retrieval, analysis and reporting of noise data, noise complaint data, weather data, aircraft operations data and geographic and demographic data. The NOISENET system is to be utilized as a tool for assessing aircraft noise impacts, primarily in communities around airbases. The NOISENET system, enables airbase planners to collect and maintain organized records of airbase flight operations, noise data, and noise complaint data and can serve as an assessment tool for evaluating noise impacts on communities and the relative effectiveness of noise abatement efforts. Consequently, NOISENET can serve as a powerful public relations tool for use in public forums, complaint resolution and legal defense. Additionally, NOISENET functions as a management system for noise and operations data collection and analysis in support of the Air Installation Compatible Use Zoning (AICUZ) process for establishing noise contours around airbases and establishing recommendations for land usage. NOISENET implements the NOISECHECK analysis methodology to validate or update airbase noise contours generated by the NOISEMAP noise modeling program on the basis on measured noise levels. | | | | |
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PREFACE

The NOISENET Noise Management System concept and software described in this report were developed for the Armstrong Laboratory Noise Effects Branch (AL/OEBN) by Wyle Laboratories, Wyle Research under Contract Number F41624-93-C-9006, Exploratory Environmental Noise Research. The software developer for Wyle Laboratories was Mr. Alan Dent and the Program Manager was Dr. Ben Sharp. Original concept plans for the NOISENET system were developed by Mr. Ron Brown and Mr. Carey Moulton of Wyle Laboratories. Dr. Kenneth Plotkin of Wyle Laboratories provided technical evaluations and support throughout the project development lifecycle. The contract monitor for AL/OEBN was Mr. Robert Lee and technical oversight of the project was provided by Dr. Bartholomew Elias. Mr. Henry Mohlman of the University of Dayton Research Institute (UDRI) developed the noise monitor communications programs responsible for acquiring data from Larson-Davis noise monitors which are currently implemented in the NOISENET system.

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INTRODUCTION

In recent years, the application of permanent noise monitoring networks for measurement and analysis of aircraft noise in the vicinity of civil airports has proven to be a practical method for providing a continuous record of noise data generated by flight operations. These data have been utilized to determine the long-term noise environment in areas around airports and for assessing the nature and extent of aircraft noise impacts on surrounding communities. Permanent noise monitoring systems are utilized to provide direct assessments of aircraft noise at key locations in the vicinity of an airport that has specific concerns regarding community noise impacts (1). These monitors provide quantitative data specifying the extent of community noise impacts which can be utilized by planners to assess noise abatement alternatives. Subsequently, to assess the relative effectiveness of abatement measures, noise monitoring data can be analyzed to assess trends in noise impacts and document the benefits of noise control actions. By implementing permanent noise monitoring systems, airports have been able to improve community relations by demonstrating their dedication to noise abatement and these systems have proven highly useful as a repository for factual evidence documenting airport noise abatement efforts for defense against legal actions over noise impacts.

Noise monitoring systems have been utilized for over 30 years at many airports worldwide. Modern noise management systems provide direct measurement of aircraft noise at specific locations in the community and also detailed information of aircraft operations and tracks. The data derived from the system permits airport staff to :

- Respond to community aircraft noise complaints and identify responsible aircraft.

- Define quantitatively the extent of community noise impacts for more effective abatement actions.
- Identify trends in the noise impact and the effectiveness of current and future noise control actions
- Identify violations of airport noise abatement rules.
- Improve community relations by providing visible examples of the airport's dedication to noise abatement.
- Provide factual evidence of airport noise abatement efforts for defense against potential lawsuits by airport neighbors.

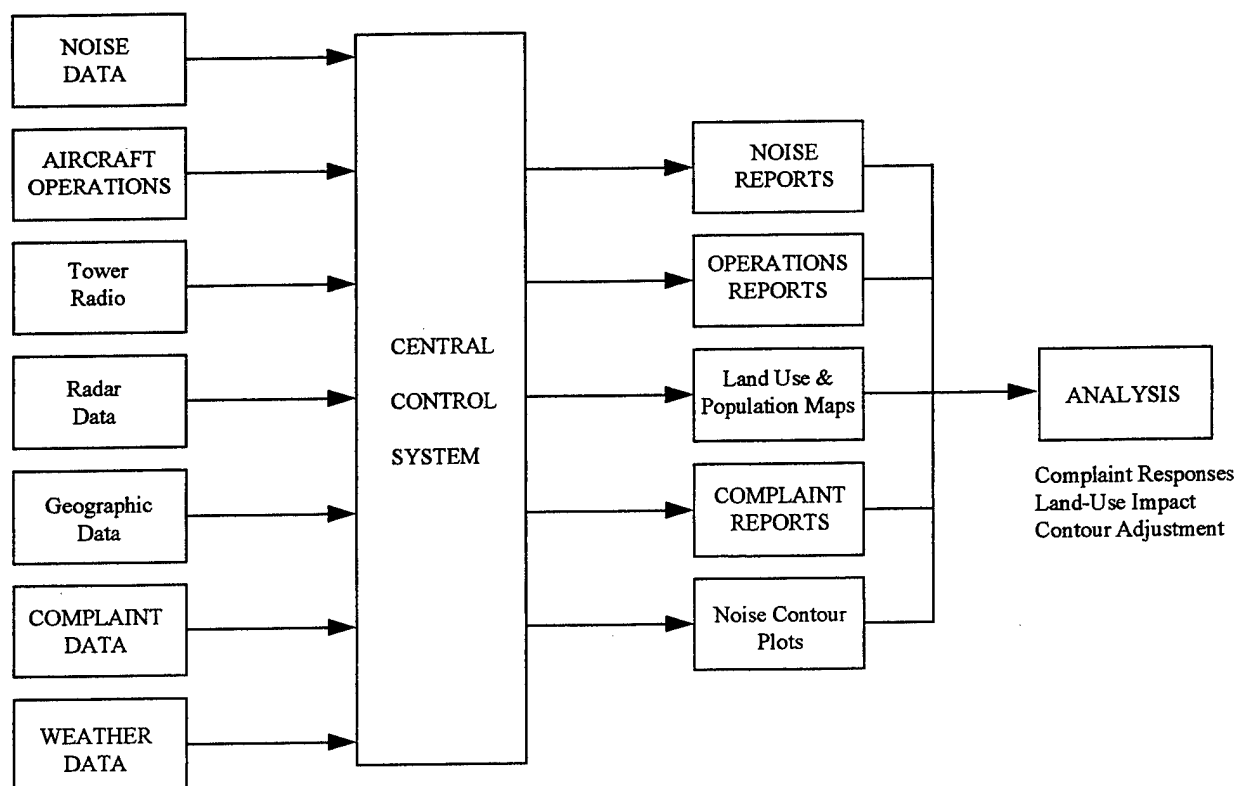


Figure 1. A typical noise management system (Basic components are presented in uppercase letters).

A block diagram for a typical noise management system is shown in Figure 1. The basic components of a noise management system include acoustic noise data, aircraft operations data, complaint data and weather data. Supplementary features

such as radar data, tower frequency recorders, geographic information displays, and noise contour mapping capabilities may be included in more advanced noise management systems. Sophisticated noise monitoring and management systems are in place at many of the major airports throughout the United States and in Europe and Asia.

While there has been an increasing reliance on permanent noise monitoring systems at civil airports, the use of monitoring networks at U.S. Air Force airbases has been relatively limited and the Air Force has relied principally on portable noise monitors for the acquisition of aircraft noise data. This approach requires substantial manpower commitments to place monitors around the airbase, to download data from these monitors over extensive periods of time, and to reduce the data obtained and generate meaningful assessments of noise impacts. In lieu of extensive monitoring efforts, the Air Force has developed the Air Installation Compatible Use Zoning (AICUZ) process to define noise impacts in the areas surrounding airbases. The AICUZ process assesses the noise impact on areas around airbases using noise contours generated by the NOISEMAP computer model of aircraft operations noise. When the contours produced by NOISEMAP during the AICUZ process are challenged or verification of these predicted noise levels is sought, then the NOISECHECK procedure is implemented. The NOISECHECK procedure involves a statistical comparison of the NOISEMAP modeled noise data to measured noise levels around the airbase. In order to modify predicted noise contours, the NOISECHECK process proceeds with an iterative process of measurement, data analysis, contour adjustment, and contour validation to make the AICUZ noise predictions concordant with existing measured noise levels. During this process, it is often necessary to obtain extensive supporting data relating to flight activity, airbase operations, and weather conditions in order to more accurately account for factors contributing to the overall noise environment around the airbase. The resulting noise impact data produced by these monitoring efforts can be assessed in conjunction with community demographics and complaint data to assess specific land use incompatibilities, resolve specific noise problems, and aid in the development of operational procedures and abatement programs to minimize

noise impacts in communities surrounding the airbase. The implementation of a well-designed noise data management system and noise monitoring network is an essential element in the overall AICUZ process and provides airbases with the tools necessary to resolve environmental noise issues with local communities and prevent encroachment that might limit operational effectiveness.

NOISENET is the product of a development effort to reach these specific needs for noise monitoring and noise data management at airbases within the Air Force. The NOISENET system is an airbase noise data management system consisting of a network of semi-permanent noise monitors linked by a central desktop computer containing interactive system software. The NOISENET system software is responsible for coordinating the acquisition, storage, analysis, and reporting of noise data obtained from remote noise monitors. Additionally, the system software is capable of acquiring, maintaining, and retrieving noise complaint data, weather data, aircraft operations data, and geographic and demographic data that can be utilized to aid in the assessment of airbase noise impacts. Thus, NOISENET enables airbases to maintain organized records of airbase flight operations and noise data. The system creates a record of noise impacts and noise abatement efforts that can be utilized for public relations, complaint resolution, and legal defense as well as providing the data necessary to conduct NOISECHECK analyses to validate or update noise contours generated by NOISEMAP (see Table 1).

Table 1. NOISENET Product Description and Anticipated Payoffs.

| PRODUCT | PAYOFFS |
|--|--|
| <ul style="list-style-type: none"> • Airbase Noise Data Management System • Semi-Permanent Noise Monitoring Network for Airbases • Noise, Noise Complaint, Weather Data, Aircraft Operations, Demographic and Geographic Information Acquisition, Storage, and Retrieval • Noise Data Analysis and Reporting | <ul style="list-style-type: none"> • Organized Record Keeping of Airbase Operations and Noise Data • Provides Record of Noise Impact and Noise Abatement Efforts for Public Relations, Complaint Resolution, and Legal Defense • Provides Data Analysis Tools for Validating or Updating Noise Contours |

SYSTEM DESCRIPTION

NOISENET consists of a semi-permanent noise monitoring network for airbases. The NOISENET system can be utilized to establish and maintain an historical record of operations and noise data. The system may also serve to document evidence of noise impacts and noise abatement efforts for public relations at public meetings and forums, and for litigation and complaint resolution. More typically, the system will be implemented to conduct noise monitoring over a relatively extended period of time to collect noise data for validation or refinement of noise contours generated in the AICUZ process or to provide noise and operations data as inputs to future AICUZ assessments.

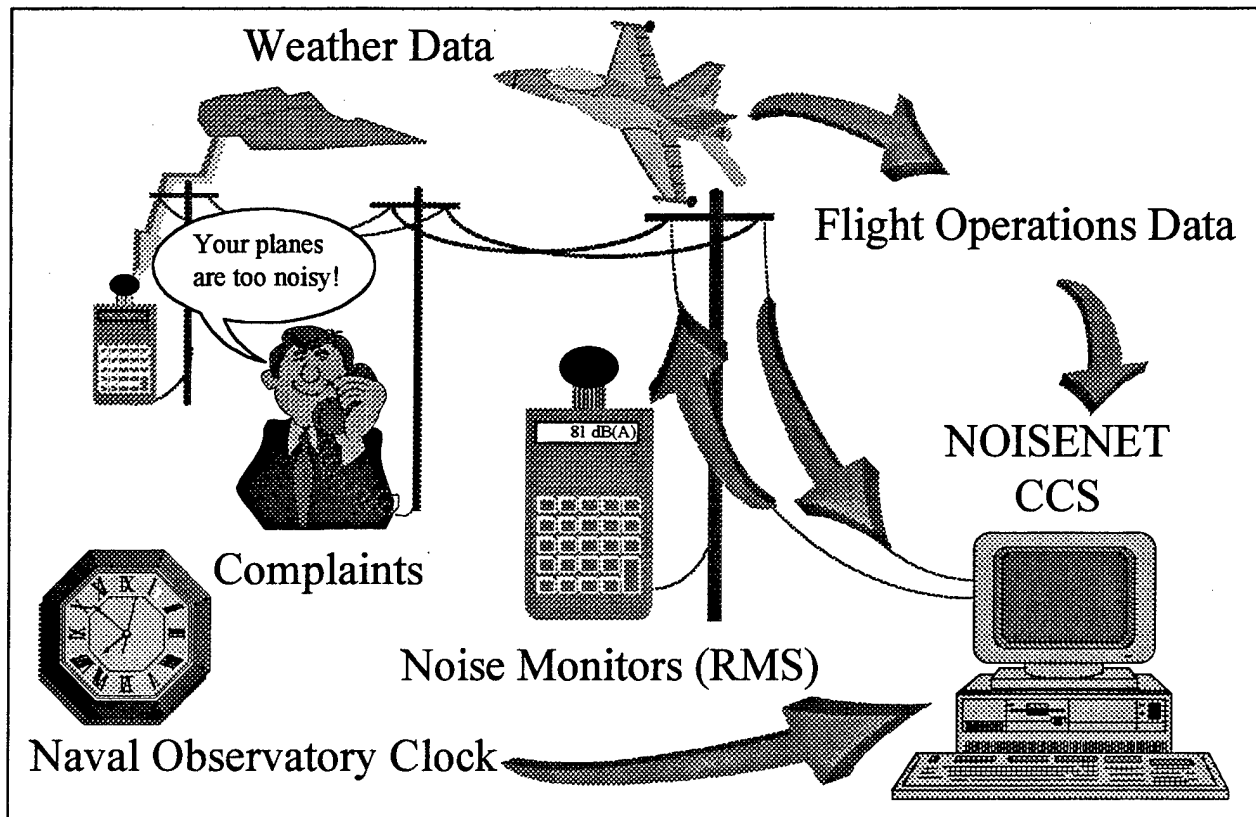


Figure 2. Overview of the NOISENET noise data management system

The NOISENET system currently handles acquisition of noise data, noise complaint data, and weather data. It is anticipated that future versions of NOISENET will be capable of acquiring and managing aircraft flight operations data from operations logs or radar tracking data. The NOISENET system is also capable of acquiring and analyzing data from the Boom Event Analyzer Recorders (BEARs) for sonic boom measurement projects. The NOISENET software converts raw data downloaded from the remote noise monitors into the NOISECHECK data format and utilizes the NOISECHECK II methodology and software to perform analyses of noise monitoring data and compare measured sound levels to those levels predicted using the NOISEMAP model. Thus, NOISENET serves as an integrated system that provides resources for data collection, data analysis, and data reporting of existing airbase noise levels.

The typical NOISENET installation is comprised of a series of several noise monitors or remote monitoring stations positioned at key locations in the communities and lands surrounding an airbase. These monitoring stations are typically linked to a central control station, a desktop computer running Windows, through modem connections that can be routed through telephone lines or cellular communications. Positioning of the remote monitoring stations is determined by the particular needs of the monitoring project. If the monitoring is being conducted for a NOISECHECK analysis, then the recommendations established in AFAMRL-TR-80-45 should be followed (4). In brief, these recommendations suggest that the selected site should provide the required noise information sought, provide security for the monitoring equipment, have low ambient or background noise levels, and not have any acoustic interferences. Sample NOISECHECK field studies describing the specific criteria for site selection to insure meaningful data can be found in AFARML-TR-82-12 (5). For other types of monitoring, various other factors may influence the site selection process. In their description of the ANMS, the Massachusetts Port Authority describes ten key criteria used in selecting noise monitoring sites (2). These criteria include:

- Noise-sensitive land use at the location
- A high magnitude of airport/aircraft noise exposure
- Individual sources of airport/aircraft noise: overflight and ground noise thereby enabling isolation and detection of individual noise events
- Access to electricity and telephone lines (not necessary if battery power is implemented or cellular communications are used)
- Ease of installation and access for maintenance
- At least 10 feet from major obstructions (trees, buildings, etc.) to avoid acoustical interferences
- Acceptability by the community
- Landowner agreement and cooperation
- Aesthetics
- Secure location

Since the remote noise monitors will be outdoors for extended periods of time, they should be contained in cases that will protect them from the elements. The choice of enclosures is dependent upon the climate and meteorological conditions of the region in which the monitoring project is being conducted and waterproof cases may be necessary in regions that are susceptible to significant amounts of precipitation. The noise monitor vendor will have more specific information and options available for weatherproofing their noise monitors.

The central control station computer is responsible for noise data acquisition through modem downloads from the remote monitoring stations. The NOISENET system, as a central controller for initiating modem downloads, can synchronize noise monitor internal clocks to a high degree of accuracy using the NAVYTIME program to reset the computer clock by obtaining precise time data from the Naval Observatory in Washington DC. This ability to maintain precise timing is extremely beneficial when analyses are performed to correlate noise events with specific flight operations data such as radar tracks or base operations flight logs. When modem downloads are not

feasible, data can be obtained manually through visitations to the remote monitoring sites with a portable computer. In either case, the central control station computer running the NOISENET system software will serve as the repository for noise, noise complaint, and weather data storage and retrieval. The NOISENET system software provides data management tools for establishing organized directory structures to maintain historical records of noise data. Additionally, the NOISENET system software provides tools for generating NOISECHECK format data files for analysis using the NOISECHECK II methodology for assessing community noise exposure from aircraft operations. The NOISENET system software also has display capabilities to enable the user to view geographic information, demographic information, noise contours, noise monitoring locations, complaint locations, and community features. This geographic information provides an invaluable tool for visualization of noise exposure and general assessments of noise impacts on communities and specific locations in the vicinity of an airbase. The NOISENET system software is also capable of generating periodic reports of various user selectable noise metrics and operations periods. The NOISENET system features are summarized in Table 2 below.

Table 2. Summary of NOISENET System Features.

| | |
|---------------------|---|
| SYSTEM DESCRIPTION: | <ul style="list-style-type: none"> • Semi-permanent noise monitoring network for airbases • Data Acquisition <ul style="list-style-type: none"> • Noise Data • Complaints • Weather • Aircraft Operations • Data Analysis <ul style="list-style-type: none"> • NOISECHECK II Methodology |
| SYSTEM HARDWARE: | <ul style="list-style-type: none"> • Remote Monitoring Stations <ul style="list-style-type: none"> • Noise Data Collection • Weather Data Collection • Central Control Station <ul style="list-style-type: none"> • Desktop Computer with Windows 3.1 or Windows 95 • Data Acquisition (Downloads) • Data Storage • Data Management |

| | |
|------------------|---|
| | <ul style="list-style-type: none"> • Communications System <ul style="list-style-type: none"> • Modems • Telephone Service and/or Cellular Communications |
| SYSTEM SOFTWARE: | <ul style="list-style-type: none"> • Key Functions <ul style="list-style-type: none"> • Data Acquisition and Storage • Data Analysis (NOISECHECK II Methodology) • Geographic Data Display • Noise, Weather and Complaint Data Handling • Report Generation • Key Features <ul style="list-style-type: none"> • Remote Data Collection • Modularity • Centralized Data Storage and Retrieval |
| SYSTEM USES | <ul style="list-style-type: none"> • Establish Historical Record of Noise Data • Evidence of Noise Impact and Noise Abatement Efforts for: <ul style="list-style-type: none"> • Public Relations, Public Meetings and Forums • Litigation Resolution • Complaint Resolution • AICUZ Program Inputs <ul style="list-style-type: none"> • Validation or modification of noise contours • Noise data for future assessments and planning |

SYSTEM SOFTWARE

Overview

NOISENET is designed to integrate various components of a portable or fixed noise monitoring and complaint management system for the US Air Force into one program that will act as both a "shell" program and data management tool. Distribution will be made by the Noise Effects Branch of the Armstrong Laboratories (AL/OEBN, 2610 Seventh Street, Wright-Patterson AFB, OH 45433-7901, Commercial Telephone 513-255-3664, DSN 785-3664).

NOISENET operates under Windows 3.1 and, with minor limitations, Windows 95.

Primary documentation is incorporated into an on-line help system. Each window has a specific help screen with additional help topics available in the help index.

NNET.EXE is the complete NOISENET program while NNETC.EXE is the complaint module.

Windows Installation

The following steps may be used to install NOISENET or the Complaints module:

Windows 3.1 Installation

1. Create a directory (preferably called NNET) onto the hard drive of your system.

2. Copy NNET.EXE (or NNETC.EXE), SUPPORT.DAT, SPECIFIC.TXT, GENERAL.TXT, and OTHER.TXT into the NNET directory.
3. For the main module you will also need to copy the file LD870SET.DAT if using the Larson-Davis noise monitors.
4. In the Windows Program Manager, make the group that the NOISENET Icon is to be installed in current. If creating a new group, select the File|New menu choice and click on the "New Group" button. Type in the name of the group (preferably NOISENET).
5. Install the NOISENET Icon by selecting the File|New menu choice and click on the "New Item" button. In the next window, click on the Browse button and go through the directory service to find the NOISENET program. Once NNET.EXE has been selected, type "NOISENET" in the program description and click on the "Change Icon" button. Select the only Icon available and quit out of this menu using the "OK" button.
6. Once NOISENET has been installed, click on the NOISENET Icon and proceed to configure the program. This configuration is not included with the Complaints module. Further information on configuring NOISENET is available through Help.
7. The last step in setting up NOISENET is to select the Load menu option to set up the current Project that you will be using. This section sets up the directory and project data needed.

Further information on installing Icons in Windows 3.1 is available in the Windows 3.1 documentation.

Windows 95 Installation

1. Follow steps 1 through 3 of the Windows 3.1 Installation.
2. Using the Windows 95 documentation, install the Program Item for NOISENET. You may also consider installing a "Shortcut" to NOISENET.

3. Follow steps 6 and 7 of the Windows 3.1 Installation.

Once the project has been set up, you are ready to run NOISENET. The suggestion is to go through each of the menu items and view the help screen associated with each of the windows.

Along with the main NOISENET program, you should have been supplied or already possess the various support programs that are used with NOISENET such as the NAVYTIME program for setting the computer clock and the programs for downloading the noise monitors. These programs need to be copied into appropriate directories and placed in the proper categories in the EXE Setup lists. These programs are not required for the Complaints module.

NOISENET Notes

- NOISENET is designed to work with either a single user or multiple users and projects. The current project needs to be set up for both the main program and the Complaints module. This is done with the Load menu item. Each Air Force Base will have a three-letter ID and each system should use a unique two letter Code. The ID and Code are used for creating default file names.
- The complaint data is stored in monthly records in a file named IDDCDYMM.cmp that is accessed by NOISENET (IDD is the ID, CD is the CODE, YY is the current year, and M is the hexadecimal current month). A comma delimited file with a similar filename except for the extension "prn" is also created for easily importing the complaint data into a spreadsheet application. If requested, the prn file will be collected by persons compiling complaint data.

- NOISENET will run under Windows 95 except for the setting of the time function and running the Download Data window (both manual and automatic). You may refer to the help menu for these items for details on specific problems.
- The text files SPECIFIC.TXT, GENERAL.TXT and OTHER.TXT are for the complaint response letters based on the complaint type and may be edited by any text editor. These files must be left in text format.
- The file LD870SET.DAT is the default configuration file for the Larson-Davis noise monitors. This file may be edited for specific projects.

System Operation

The following text is a reproduction of the help information available on-line while using the NOISENET computer software. The menus and windows associated with the specific help are also presented here in order to better orient the user and provide a frame of reference for the operations described below.

Using Help

To access help within the program, either press the help key (see Help | Keyboard) for context-specific help or use the Help menu on the Control Window.

Many of the features discussed in this help menu are not part of the NOISENET Complaints module which is distributed separately.

Introduction Window

For further information and NOISENET Support contact either:

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NOISENET Application

Welcome to NOISENET. Use the mouse to select an item from the main menu or press the <Alt> key in combination with the first letter of the item.

To exit at any time press <Alt+F4> from the main window.

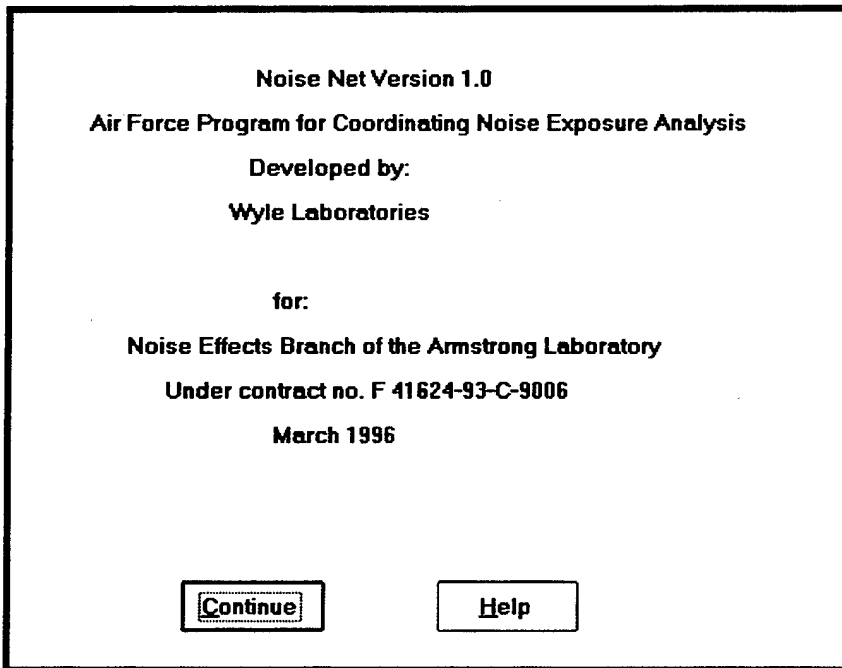


Figure 3. NOISENET introduction screen.

Application Procedures

ACCESSING A MENU:

To access a menu associated with the current window, either click on the desired option with the left mouse button, or press <Alt> + the letter underlined in the menu item's text.

CHANGING FIELDS:

To move from the current field to another selectable window field using a mouse, simply click on the new field. To move to the next field using the keyboard press <Tab>. To move to the previous field using the keyboard press <Shift Tab>.

CHANGING WINDOWS:

To move from the current window to another, click on the next window with the mouse.

CLOSING A WINDOW:

If the window includes a system button, select the "Close" option from the system button, or press <ALT+F4> to close a window. Pressing <Esc> closes a temporary window (e.g., a pop-up menu).

MAXIMIZING A WINDOW:

To increase a window to its maximum size, select the system button's "Maximize" option.

MINIMIZING A WINDOW:

To reduce a window to its minimum size, select the system button's "Minimize" option.

MOVING:

To move an entire window, either position the mouse cursor on the window's title bar, press the left mouse button, and drag the window. If the window has an associated system button, you can select the "Move" option from the system button and then drag the window using the arrow keys.

RESTORING A WINDOW'S SIZE:

To restore a window to its original size, select the system button's "Restore" option.

SIZING:

To size a window using a mouse, position on the border of the window so that the cursor changes to a double arrow, and drag the mouse. If the window has an associated system button, you can select the "Size" option from the system button and then drag the window's border using the arrow keys.

Mouse Movement

The following movement is defined for the mouse within the program:

Choose <Left-down-click>

Select <Left-release>

Keyboard Movement

The following movement is defined for the keyboard within the program:

| | |
|------------------|---------------------|
| Begin field | <Ctrl+Home> |
| Delete character | |
| Delete prev char | <Backspace> |
| Delete window | <Alt+F4> |
| End line | <End> |
| Help | <F1> |
| Left word | <Ctrl+left-arrow> |
| Mark | <Shift+left-arrow> |
| | <Shift+right-arrow> |
| | <Shift+up-arrow> |
| | <Shift+down-arrow> |
| Menu control | <Alt> |
| Next field | <Tab> |
| Next window | <Alt+F6> |
| Previous field | <Shift+Tab> |
| Right word | <Ctrl+right-arrow> |
| Select | <Enter> |
| System button | <Alt Space> |

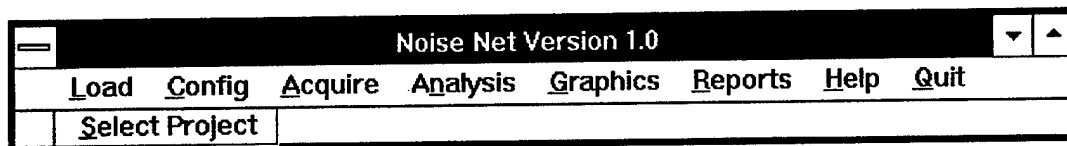


Figure 4. Load Project menu.

Load Project (Figure 5)

This window is for setting the current project name and file structure.

The Air Base name and case description are used in the headers of reports generated by NOISENET.

The 2 letter ID and the 3 letter Case are used for various default file naming purposes. Specify a unique ID for each Air Base and a unique Case for each computer.

The project file name will use the 3 letter Case and the extension .prj. Whenever NOISENET opens, it will read the current project name from the NNET.CFG file and open the project file. The project file contains the data in this screen using keyword text to define the various fields.

The reference Latitude and Longitude mark the Air Base Reference point used in the DXF maps and graphics. This is usually the reference origin used in the NOISECHECK model for the Air Base. The values are in decimal degrees.

The directory is the working and default directory for the case. The working directory is changed in many places but the default directory can only be changed in this window.

The project data must be saved for any changes to become effective. Cancel will exit this screen and return to the original data.

Airbase Setup

Airbase Name:

Case Description:

3 Letter Case: 2 Letter Airbase ID:

Reference Latitude: Longitude:

Directory: File Name:

Comments:

Figure 5. Airbase Setup window.

File Selection/Directory Service (Figure 6)

The file selection window allows users to browse drives and directories for a file that will be opened, saved or whose information will be viewed. The following fields are available in the window:

Filename:

This field contains the name of the file you wish to open, save or retrieve information from. Enter the name of the desired file then press <Enter> or select the OK button. This field does not use the DOS wildcard characters as a file filter for displaying files.

Directories:

This field contains the directories that may be browsed. A directory can be selected from the list by moving to the field and pressing <Enter>.

List Files of Type:

This field contains filters (or wild-card match information) for the type of files you want to see in the file list. The patterns in this field can be selected by pressing on the list's down arrow, moving to the desired filter, then pressing <Enter>.

Drives:

This field contains the active drives on the system. The drives in this field can be selected by pressing on the list's down arrow, moving to the desired drive, then pressing <Enter>. If the drive is available, the directory and file fields are updated. Otherwise an error message is presented.

OK:

Selecting the OK button selects the file listed in the File Name field and the program returns to the current window with the selected data.

Cancel:

Selecting the Cancel button causes the file selection window to be removed without processing the file data.

One minor problem with the Directory Service is that the displayed path may not agree with the current drive when the current drive is different from the NOISENET drive. Select a different drive then select the current drive.

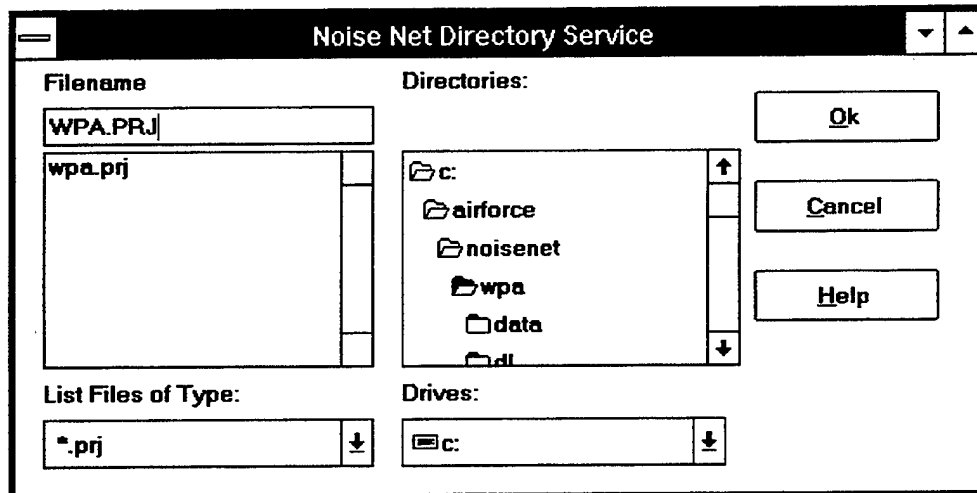


Figure 6. NOISENET Directory Service window.

Print Screen Button

The Print Screen Button/Menu Choice performs a screen dump to the windows Print Manager. If there are problems with printing the buttons or borders, you may need to adjust the print graphics using the print manager. For further information go to either the Print Manager or the Printer documentation.

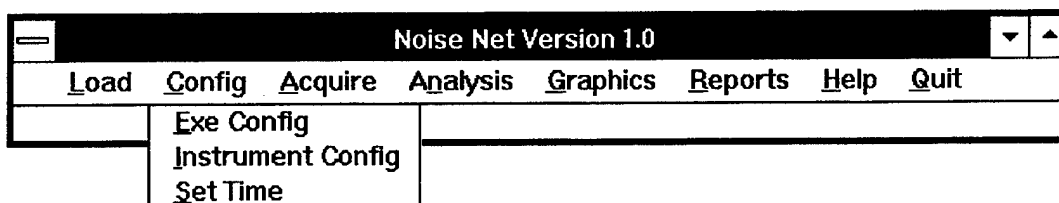


Figure 7. Configuration menu.

NOISENET Setup (Figure 8)

The Setup Screen is to identify the programs associated with NOISENET. The setup path is the current working directory. The setup file name contains the selections that were saved using the save button. SETUP.CFG is automatically read whenever NOISENET is opened.

The setup path can be changed temporarily to make it more convenient to add programs to the menus.

The Field column corresponds to the main menu items in NOISENET. The programs are the executables that NOISENET will utilize when it performs various user called functions. NOISENET changes the path to the working directory whenever the program is called. The description is for the benefit of the user except in the case of the Set Time. The description for the Set Time is the configuration file (*.cfg) name.

You can add executable programs to be called by NOISENET by selecting the "Add" button and selecting the program by using the directory service that will appear. The "DEL" button deletes the current program.

The path and description fields are automatically updated whenever a new field is selected or a button is clicked on.

Cancel will exit the Setup screen and restore the original settings. Once you have selected needed programs, you should save the settings.

The SETUP.CFG file is a keyword text file that should not be edited by the user.

| Field | Program | Path | Description | | |
|----------|--------------|----------------------|----------------|-----|-----|
| Acquire | | | Acquire | Add | Del |
| Analysis | nc2dnl.exe | c:\airforce\noisenet | Noisecheck_DNL | Add | Del |
| Monitors | ld820_dl.exe | c:\airforce\noisenet | ld820_dl.exe | Add | Del |
| Graphics | | | Graphics | Add | Del |
| Reports | | | Reports | Add | Del |
| Set Time | navytime.exe | c:\airforce\noisenet | Navytime | Add | Del |

Open Save Continue Help Print Screen

Figure 8. Executable Program Setup window.

Executable Programs

Executable programs are loaded into NOISENET using the Setup | Exe Config menu screen. Except for the communications and time programs, NOISENET will automatically create a generic window for each of the executable programs selected.

The "Command Line" is added to the command when the executable is called.

Whenever the "Execute" button is selected, a change directory command is set to change the current directory to the directory listed in the "Current Directory" field.

Since this is a windows application, you can return to NOISENET either by quitting the program called or by using the <Alt> <Esc> or <Alt> <Tab> keys. These should behave as a normal type of windows hot-key to change the Current Window. Depending on the application, there may be some problems with returning control to NOISENET. As explained in the Known Bugs and Problems help screen, do not attempt to switch between windows while downloading data or setting the system time.

Default Instrument Setup (Figure 9)

This window is for editing the default instrument configuration file. NOISENET assumes that the download program will set the noise monitor parameters using a configuration file.

Instrument Default Setup Noise Net Programs

File Path Name: :\\AIRFORCE\\NOISENET\\WPA

Instrument Setup File Name: LD870SET.DAT

Set

Current Setup

"S2,UDRI Test of the LD870 Program" 'Test name
 "S3,Bldg 441, RM 2-20, Area B " 'Location name
 "S4,Henry Mohlman, UDRI, 255-3661" 'name - office - phone
 "S5,01" ' site location
 "S10,0" ' disable network mode
 "S12,15" ' Handshaking
 "S14:[Off]" ' Output 1 logic
 "S15,0" ' Output 1 Hold Time
 "S16:[Off]" ' Output 2 logic
 "S17,0" ' Output 2 Hold Time
 "S18:[Toggle]" ' Halt line mode
 "S19:[No]" ' tone while running
 "S20:[Auto Off]" ' power save
 "S21,3" ' timer mode
 "S22,10/29/92" ' start date
 "S23,11/10/92" ' stop date
 "S24,08:30:00" ' start time
 "S25,21:00:00" ' stop time
 "S26,05:56:00" ' 2nd start time
 "S27,06:04:00" ' 2nd stop time
 "S28,11111111" ' lock combination

Open Save Cancel Continue Help Print Screen

Figure 9. Default Instrument Setup window.

For further information concerning site parameters, see either the monitor's user's manual or the documentation that comes with the communications program. If using the Air Force LD820_DL or LD870_DL program, help is available in the NOISENET Help Index.

Detailed descriptions of these Larson Davis noise monitor communications programs developed by Mr. Henry Mohlman of University of Dayton Research Institute (UDRI) are provided in Appendix I.

Set Computer Time (Figure 10)

Select the program and the config file for the set time program in the NOISENET Config menu.

To execute the set time program immediately, press the "Set Time" button. Typically this will execute the listed program and update the computer clock. If using the NAVYTIME program, there is no logging of the success or failure of your attempt to reset the system clock once the screen is deactivated and returns to NOISENET.

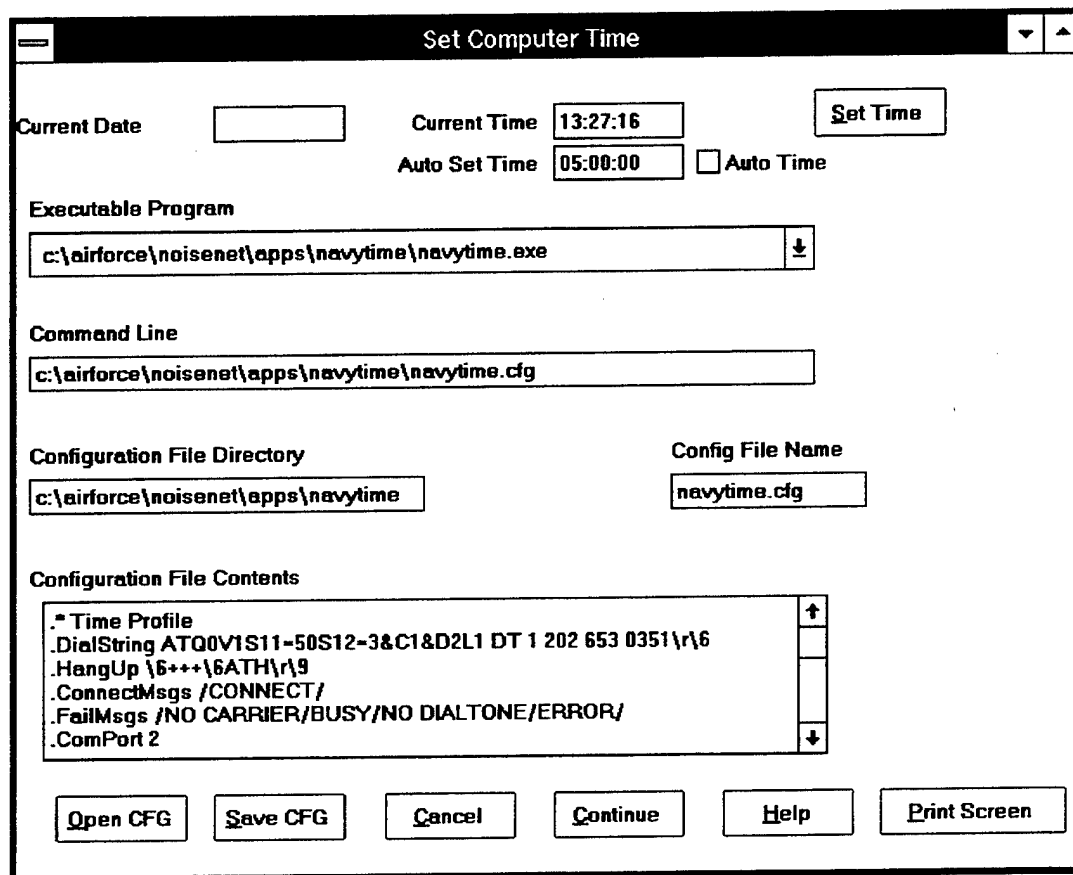
To automatically execute the set time program, type the daily time to reset the clock in the "Auto Set Time" field and check the "Auto Time" check box.

The auto-time function works only if the Set Time screen is active, either displayed or minimized.

Insure that the proper communications port is called for. This parameter is normally in the configuration file.

The configuration file name is added to the command line whenever the program is activated.

If using the NAVYTIME.EXE program, more help is available under the NAVYTIME help topic.



The image shows a Windows-style dialog box titled "Set Computer Time". It contains several input fields and buttons. At the top, there are fields for "Current Date" (empty), "Current Time" (13:27:16), and "Auto Set Time" (05:00:00). A "Set Time" button is to the right of the "Current Time" field. Below these is a checkbox labeled "Auto Time" which is unchecked. The "Executable Program" field contains the path "c:\airforce\noisenet\apps\navytime\navytime.exe". The "Command Line" field contains the path "c:\airforce\noisenet\apps\navytime\navytime.cfg". The "Configuration File Directory" field contains "c:\airforce\noisenet\apps\navytime" and the "Config File Name" field contains "navytime.cfg". The "Configuration File Contents" field contains a list of commands: ".* Time Profile", ".DialString ATQ0V1S11-50S12-3&C1&D2L1 DT 1 202 653 0351\r\6", ".HangUp \6+++\6ATH\r\9", ".ConnectMsgs /CONNECT/", ".FailMsgs /NO CARRIER/BUSY/NO DIALTONE/ERROR/", and ".ComPort 2". At the bottom, there are buttons for "Open CFG", "Save CFG", "Cancel", "Continue", "Help", and "Print Screen".

Figure 10. Set Computer Time window.

NAVYTIME Program

NAVYTIME calls the Naval Observatory in Washington, DC for the correct time, and sets your computer's time accordingly. NAVYTIME sets your system clock, the real-time clock in an AT, and optionally it can set the clock of a Novell file server if run from a workstation signed on as the supervisor.

NAVYTIME was written by Zedak Corp of New York City, and may be used and copied freely.

syntax: NAVYTIME [parmfilename] [/w]

or NAVYTIME ? or NAVYTIME /help for a help message

parmfilename is the name of a parameter file.

if a parmfile is not specified, NAVYTIME looks for one called NAVYTIME.CFG in the current directory.

/w means write a default parameter file.

it is written to parmfilename or to NAVYTIME.CFG if no parmfilename was specified.

The parameters file is an ASCII text file with one line per parameter. Each line consists of a keyword followed by a blank followed by a parameter. Keywords all start with a period. The keywords are:

1) .DialString is a command string to cause the modem to dial the Naval Observatory. The string can be whatever it takes to make your modem do its thing. The default string is suitable for a Hayes 2400 baud modem or compatible. The following command sequences are recognized by NAVYTIME when embedded in the dial string, and are handled specially during dial command transmission:

- \d quit if the modem Data Set Ready signal is not active
- \c quit if the modem has not sent back any chars yet

\1 thru \9 delay n timer ticks (18ms each)
\n emit linefeed (hex 0A)
\r emit carriage return (hex 0D)
\b emit blank (trailing blanks are trimmed in dial string)

2) .HangUp a control string to cause the modem to hang up.

This is not really needed for a Hayes because the default dial string will cause the Hayes to hang up when NAVYTIME drops the Data Terminal Ready signal, but some compatibles don't have that feature.

3) .ConnectMsgs a set of messages to be recognized as an indication that the modem has connected. The messages are started, ended, and delimited by slashes. For a Hayes or compatible, CONNECT is the standard message, so /CONNECT/ is a good parameter.

3) .FailMsgs a set of messages to be recognized as an indication that the modem has failed to connect. The messages are started, ended, and delimited by slashes. For a Hayes or compatible, /NO CARRIER/BUSY/NO DIALTONE/ERROR/ all indicate we are not going to get through.

4) .CharDelay A number of ticks to delay between characters of dial command string. Some modems cannot accept command strings at full speed (like MicroCom), so CharDelay should be set to 1 for them. For a Hayes, 0 is fine.

5) .ComPort may be 1 or 2 for COM1 or COM2.

6) .TimeZone The number of hours to add to a Zulu time to

compute local time. For Eastern Standard Time, -5 is correct.
for Pacific Standard, -8 is correct.

7) .Daylight y if Daylight Savings is in effect.

8) SetServer y if the computer is a workstation on a Novell
Network and NAVYTIME should set the file server's time as
well. This feature requires that the workstation be signed
on with supervisor authority.

Default Parameters

.DialString \dATQ0V1S11=50S12=3&C1&D2L1 DT 1 202 653 0351\r\6
.HangUp \6+++ \6ATH\r
.ConnectMsgs /CONNECT/
.FailMsgs /NO CARRIER/BUSY/NO DIALTONE/ERROR/
.CharDelay 0 1 = slow modem commands (MicroCom)
.ComPort 1 Com 1 or Com 2 are supported
.TimeZone -5 Hours to add to Zulu for local
.Daylight n Daylight Savings time
.SetServer y y means set Novell Server clock (requires supervisor privilege)

System Clock Display

Several screens will have the current system date and time displayed for your benefit.
These fields cannot be selected.

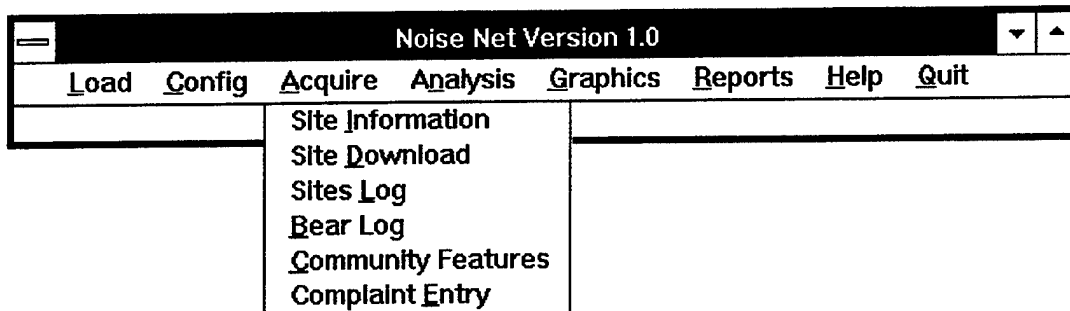


Figure 11. Acquire menu.

Site Information (Figure 12)

This window is for entering and displaying the basic site information data.

The default site file name is based on the 2 letter ID from the Select Project window with "site" and the extension .DAT added to the case name. This file is automatically opened whenever NOISENET opens the initial project.

The Selected Sites list contains the current sites.

After the Site Number, Site Name, and all other available information is entered, a site may be added by pressing the "ADD" button. If information on a site needs to be updated, the data must first be entered in the appropriate field and the "Update" button selected. The "Del" button is used to delete the current site.

The Latitude and Longitude must be in Degree-Decimal Format.

The Site Download window adds information concerning the site download parameters. The graphics window displays the site location. The location can be edited in the Features | Monitors section.

| Site Information | | | | |
|--|------------------------------|--------------|--------------|-------------|
| File Directory | c:\airforce\noisenet\wp | | File Name | WPsite.dat |
| Select Sites | Site Number | Site Name | | |
| 01 | 1 | OEBN_Trailer | Add | UpDate |
| | | | Del | |
| Property Owner | Bart_Elias | | Model # | 870 |
| Street Address | 2610_7th_Street | | Serial # | 0 |
| City State Zip | WPAFB_Ohio | | Mic # | 0 |
| Owners Phone | 255-3675 | | Install Date | 2/6/96 |
| Elevation | 825 | | Cal Due | 2/9/96 |
| Latitude | 39.813714 | | Modem # | 9-286-3686Y |
| Longitude | 84.064068 | | | |
| Description | Call BaseOps before entering | | | |
| <div> <input type="button" value="Open"/> <input type="button" value="Save"/> <input type="button" value="Cancel"/> <input type="button" value="Continue"/> <input type="button" value="Help"/> <input type="button" value="Print Screen"/> </div> | | | | |

Figure 12. Site Information window.

Site Download (Figure 13)

This window is for setting up and communicating with the monitor sites. The communications can be either manual or on a timed daily basis.

The Run Time is the daily time the site will be contacted. By selecting the Timer On check box, the auto time will be activated for that specific site. To activate all sites, you must go through the lists of sites and checking the Timer On button if it has not already been selected. The Timer On status will be active as long as the Download screen is not destroyed. You may minimize the download screen and/or have another window current and the Download screen will still remain active.

The site is selected from the Site Select list which is populated by the Site Information window. The Site Name and phone number cannot be changed in this window. You must go to the Site Info window to edit these fields.

The command line is added to the executable file name when the download program is initiated. The default command line is based on the LD870_DL.EXE program command line. Insure that the proper COM port is used.

The executable program is initially entered in the NOISENET Config | Setup window. The Site Configuration file is added to the command line. The configuration file can be edited by pressing the Open CFG button. The file must be saved in order for the executable to use the current data in the text window.

A different site file can be opened with the Open Site Button. this will reset all the current sites to the contents in the site file. Storing different site files is not the recommended method to use in NOISENET without using a different case code. However, you may have unique settings that you are saving in a specific site file.

The output path determines where the downloaded data will be sent. The Set Datapath button will call up the Directory Service for selecting the directory.

Pressing the Send button will call up the current site and perform the operations listed in the command line.

The Command line uses the following commands that can be found in the documentation found with the LD870_DL program that is modified for command line execution (Text after the "-" is not in command line)

LD870_DL

00 -Site number

COM2: - Com port where COM1: is the default

INT - Download Interval data

EXC - Download Exceedance data

SUM -Download summary data

WXD -Download weather data

DNH -Download daily noise history report

RCL -Download run/stop cal records

RST -Reset all data histories if report downloads are complete

RSA -Reset all data histories and reset parameters

SU: -Setup file name where the default is LD870SET.Dnn

LF: -Output log file name defaults to SnnLOG.DAT

PH: -Phone number/ without it does a direct connect

Interval (INT), Exceedance (EXC), Summary(SUM),Daily (DNH), and run/stop cal (RCL) are saved in the following formats: SxxINT.Dnn where xx is the site, nn is the file sequence

For the Hayes compatible modem that was used, set the default power up settings to :
X4 V0 E0 Q0 S0=5 and use 2400 baud rate and set the 870 S154,[yes] -allows modem communication S9,2400 -sets the communication baud rate

Several other parameter settings are necessary for compliance with NOISENET. These settings are in the default files supplied with the LD programs.

The maximum command line length is 128 characters and the directory paths may be included. NOISENET changes the directory to the executable path prior to starting the DOS process. After the process returns, NOISENET changes the current path to the previous path.

The autotime function initiates the process when the clock is greater than or equal to one second after the time listed. The site timer determines if the autotime function is on or off.

The executable files are originally selected in the Config NOISENET module.

For the LD870 Download program the following are the command line choices:

nn [INT] [EXC] [SUM] [WXD] [RST] [RSA]

Where nn is the site number (required); INT - download interval report; EXC - download exceedance report; SUM - download summary report; WXD - download weather data file (if available); RST - reset all data histories if report downloads are complete RSA - *reset all data and input new setup parameters

*must be run interactively for changing the monitor time

The default config file is selected along with the config file while the site config is for the individual site. It is understood that the config file name is not entered in the command line for the individual site: 1) The default config will be copied to a backup file (*.bak). 2) The Site config file will be copied to the default config name. 3) The process will be run. 4) The default config file will be copied back to its original name.

Whenever NOISENET calls upon a DOS program, NOISENET is placed in a Waiting Mode for the DOS program to terminate and the screen to close. If you try to switch between open windows whenever NOISENET is in this waiting state, the system may crash or become non-responsive. For this same reason, NOISENET does not currently work with Windows 95 because whenever the DOS program is finished, the window goes into a program terminated mode and the window remains open with control returned to NOISENET. However, NOISENET is still waiting for the window to close before it proceeds.

Detailed descriptions of the Larson Davis noise monitor communications programs developed by Mr. Henry Mohlman of University of Dayton Research Institute (UDRI) are provided in Appendix I.

Individual Site Communications Program

Date: Time: AutoTime: 5:20:00

Site Select: 01 Site Name: Run Time: 5:20:00

Modem Phone #: Auto Download: ☐

Command Line: 01 COM2: INT EXC SUM DNH RCL SU:C:\WPA\LD870SET.D01 PH:9-286-3686Y Send

| | Name | Path | Default Config File |
|-------------|--------------|-------------------------|---------------------|
| Executable | ld870_dl.exe | c:\airforce\noisenet\ap | |
| Site Config | LD870SET.S01 | :\airforce\noisenet\wpa | |
| Site File | WPSITE.DAT | c:\airforce\noisenet\wp | Open Site Save Site |

Output Path: C:\WPA\DL Set Path

Site Config File Contents

```
"S2,UDRI Test of the LD870 Program" 'Test name
"S3,Site 01 Cellular" 'Location name
"S4,9-286-3686Y" 'name - office - phone
"S5,01" 'site location
"S10,0" 'disable network mode
"S12,15" 'Handshaking
```

Open CFG Save CFG Cancel Continue Help Print Screen

Figure 13. Individual Site Communications window.

Site Log (Figure 14)

This screen is for creating a log file for site visits and downloads.

The current date and time are not selectable.

The down load data and time are selectable. Whenever the Time Sync is checked and the current entry is the last selection, the time and date automatically update with the system clock.

The Site is a horizontal site list that contains the sites created in the Site Information window. The site name and monitor SN may be edited but this change will only be effective for the current record.

The Clock Offset is in seconds and is the Site - Computer time.

The memory is the available memory. If possible, use -1 when entering an unknown value.

The comments are for any additional information that is useful for determining the monitor status such as up or down.

The Log Records are the current records in memory. A record can be made current by either clicking on that record or using the Previous and Next buttons.

To create a new record, type in the information then click on the Add button. A new record will be created after the current record.

To update a record click on the Replace button.

The open and save buttons are for reading or writing the selected files.

The sort button will place the records in order by date and time. The sort button will also create site logs for each individual site.

The file name is based on the following IDMY.Y.LOG ID - Project ID, MYY = month year

Monitor Site Visit/Contact Log

Current Date 4/15/96 Time 13:25 Log File Name WPA964.log

DownLoad Date 4/15/96 Time 13:25 ☐ Time Sync Add

Site 01 Site Name OEBN_Trailer Monitor SN 0

Intv Excd Hist Memory Battery Cal Offset

Reports 0 0 0 -1 -1% 0

Clock Offset 0 Sec(Tb-Tc) Dglete

Comments Previous

Log Records Next

Replace

Open Save Sort Continue Help Print Screen

Figure 14. Site Log window.

To update a record click on the Replace button.

The open and save buttons are for reading or writing the selected files.

The sort button will place the records in order by date and time. The sort button will also create site logs for each individual site.

The file name is based on the following IDMY.Y.LOG ID- Project ID, MYY = month year

BEAR Log File (Figure 15)

This screen is for creating a log for BEAR site visits and downloads

The current date and time are not selectable

The download date and time are selectable. The Sync button automatically updates the date and time using the system clock.

The Site is a horizontal site list that contains the sites created in the Site Information window. The site name and monitor SN may be changed in this window. However, this change will only be effective for the current record.

The Event Raw and Valid boxes are from the BEAR unit raw and valid events counts.

The Clock Offset is in seconds and is the BEAR - Computer time.

The memory is the available memory. For record keeping purposes, use -1 when the available memory is unknown.

The comments are for any additional information that is useful for determining the BEAR status such as if the BEAR was up or down.

The Log Records are the current records in memory. A record can be made current by either clicking on that record or using the Previous and Next buttons.

To create a new record, type in the information then click on the Add button. A new record will be created after the current record.

To update a record, click on the Replace button.

The Open and Save buttons are for reading and writing files.

The Sort button will place the records in order by date and time. The sort button will also create site logs for each individual site and save the current buffer contents.

The file name is based on the format IDMY.Y.LOG ID where the ID is the project ID and MY.Y is the hexadecimal month and year.

The screenshot shows a software window titled "Bear Site Visit/Contact Log". The window contains several input fields and buttons. At the top, there are fields for "Current Date" (4/15/96), "Time" (13:22:27), and "Log File Name" (WPA964.log). Below these are "DownLoad Date" (4/15/96), "Time" (13:21), a "Time Sync" checkbox, and a "WPA964.log" field. The main section has "Site" (01), "Site Name" (OEBN_Trailer), and "Monitor SN" (0). Below these are "Raw" (0), "Valid" (0), "Battery" (12 V), "Clock Offset" (0), "Background" (empty), "Memory" (-1 k), and "Sec(Tb-Tc)" (empty). There is a "Comments" text area. On the right side, there are buttons for "Add", "Delete", "Previous", "Next", and "Update". At the bottom, there is a "Log Records" section with a large empty box. At the very bottom, there are buttons for "Open", "Save", "Sort", "Continue", "Help", and "Print Screen".

| Current Date | Time | Log File Name |
|--------------|----------|---------------|
| 4/15/96 | 13:22:27 | WPA964.log |

| DownLoad Date | Time | Time Sync | Log File Name |
|---------------|-------|--------------------------|---------------|
| 4/15/96 | 13:21 | <input type="checkbox"/> | WPA964.log |

| Site | Site Name | Monitor SN |
|------|--------------|------------|
| 01 | OEBN_Trailer | 0 |

| Raw | Valid | Battery | Clock Offset |
|-----|-------|---------|--------------|
| 0 | 0 | 12 V | 0 |

| Background | Memory | Sec(Tb-Tc) |
|------------|--------|------------|
| | -1 k | |

Comments

Log Records

Buttons: Open, Save, Sort, Continue, Help, Print Screen, Add, Delete, Previous, Next, Update

Figure 15. BEAR Log window.

Community Features (Figure 16)

This Window is for entering in community features such as churches, parks, and schools. In this window, you will input the specific information about the feature such as address and point of contact. Next you will go to the graphics window and features window to select the individual symbol and further refine the Lat/Long data points.

| Feature ID | Number | Feature Name |
|------------|--------|--------------|
| 04 | 04 | AL/OEBN |

Property Owner: Bldg_441
Street Address: 2610_Seventh_St
City State Zip: WPAFB_OH_45433
Owners Phone: 513_255_3664
Elevation: 850
Latitude: 39.787856
Longitude: 84.079498
FAX #: 513-476-7680
Description: This is the location of the Armstrong Laboratory Noise Effects Branch

Figure 16. Community Features window.

Complaints Entry (Figure 17)

This module is for recording complaints.

| Record Complaint | | | |
|---|--|--|----------|
| Current Date | | Time 11:58:05 | |
| Air Field Rep | Airman Jones | 2/7/96 | 14:33:57 |
| Name | Bart Elias | | |
| Street Address | 2610 Seventh Street | | Add |
| City State | Wright Patterson AFB OH | | |
| Zip Code | 45433-7901 | Contact | Delete |
| Phone | 255-3675 | Bart | |
| Nature of Complaint | | | Previous |
| <input checked="" type="radio"/> Specific Flight <input type="radio"/> General <input type="radio"/> Other | | | |
| Specific Flight Information | | Action Taken | Next |
| Date | 2/7/96 | Sent Response Letter. Investigating with local F-16 wing regarding flight activity | Update |
| Time | 14:33:57 | | |
| Aircraft Type | F-16 | | |
| Activity | Low Pass | | Graphics |
| Activity | Very Loud. Shook Bldg. Rattled Windows | | |
| Interrupted and Comments | | | |
| <div> <div>Respond</div> <div>Open</div> <div>Save</div> <div>Continue</div> <div>Help</div> <div>Print Screen</div> </div> | | | |

Figure 17. Complaint Entry window.

To Add a record, fill in as many fields as known and click on the "Add" button. To change a record, edit the appropriate field and click on the "Update" button. The Previous and Next buttons are for scrolling through the records.

The grouped radio buttons are for selecting if the complaint was due to a Specific Flight, of a General Nature, or Other and will select which text file NOISENET will use in the response template. The response text is located in .TXT files in the NOISENET directory and are named SPECIFIC.TXT, GENERAL.TXT, and OTHER.TXT to correspond to the selected button. This text may be edited by the user and saved as a Text type of document.

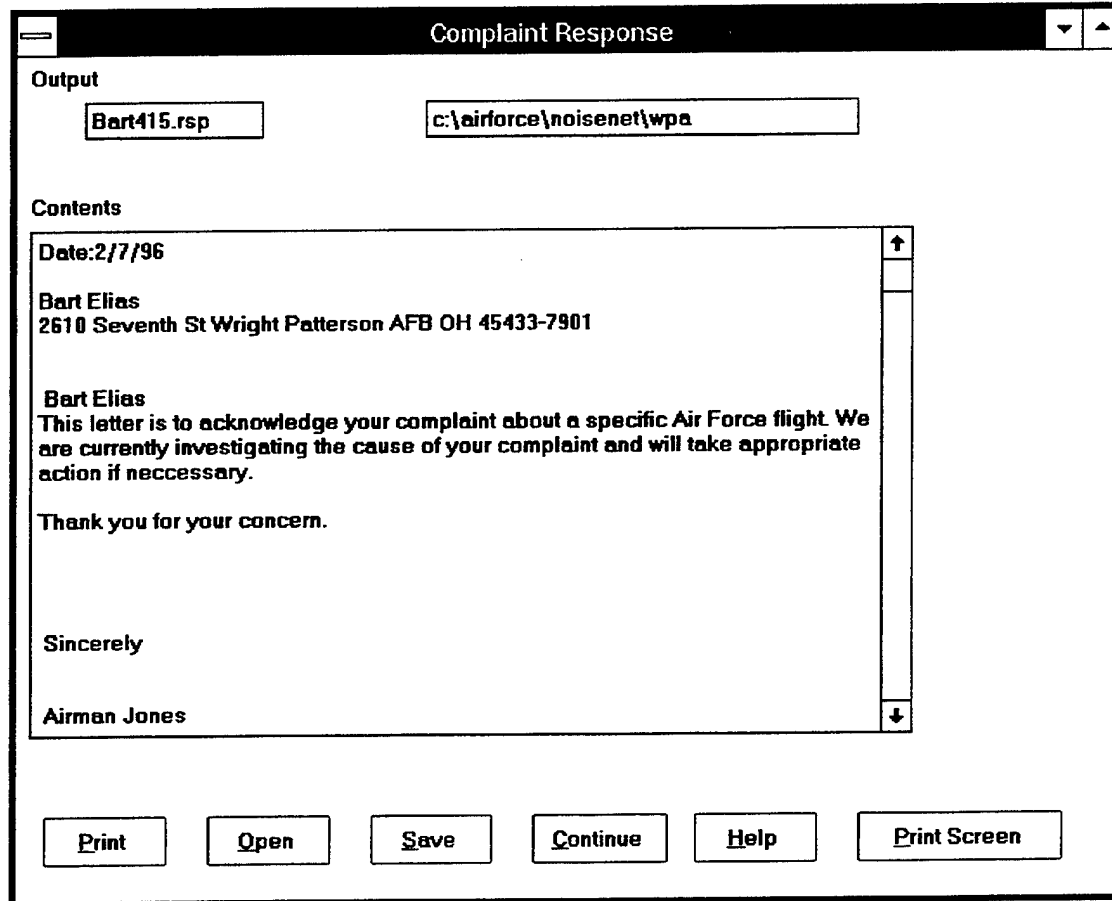


Figure 18. Complaint Response window.

The main purpose for the response is to acknowledge that the complaint was received. Any follow up to a complaint shall be within the airbase's SOP or as directed.

Each record will be stored in a file with the extension of "CMP" and the general file name will be AAAIDYYM.cmp where AAA is the base identifier, ID is the 2 letter code, YY is the year and M is the hexadecimal month. It is strongly encouraged to use different case letters for each computer that takes in complaint data.

An attempt should be made to populate as many fields as possible. This will greatly help in long term studies for complaints around airfields. Along with the keyword file

for storing the complaint information, a tab delimited file with the extension of "PRN" is created. This file can be imported into a standard spreadsheet application. If requested, this should be the file that you may send to authorized personnel requesting complaint records.

The graphics button turns on the DXF viewer screen and opens up the Features window. The Graphics button is not included in the Complaints Module version of NOISENET.

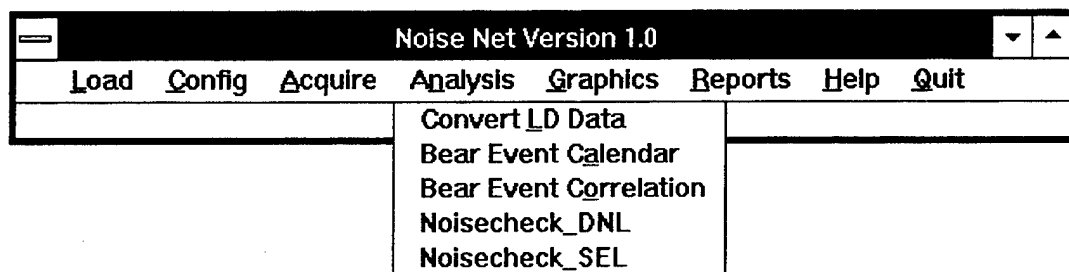


Figure 19. Analysis menu.

Converting LD data to NNET Data (Figure 20)

This window is for converting Larson Davis "printer dump" raw data to the NOISECHECK II format. The LD870_DL and LD820_DL programs use the printer dump mode for retrieving data.

The Input Directory is the raw data file directory. The filter field will limit the files to the specified types using valid DOS filename strings and the standard DOS wildcard characters. You can also restrict the file types by deselecting the check boxes at the right of the screen. The noise monitor types are selected using the buttons on the upper right of the screen.

The Output Directory is the directory that the converted NOISECHECK II formatted data files will be sent. If you specify a directory that does not exist, NOISENET will

Convert Larson Davis to NNet Format

Input

Directory:

Filter:

Output

Directory:

File Name:

File Contents

☐ LD Model #

☐ 700

☐ 820

☐ 870

☒ All

☒ Excedances

☒ Intervals

☒ Summary

| Cnt | Date | Time | Duration | Leq | Lmax | Peak | Uwpk | SE | EXCD | OVL | Dir | Gust |
|-----|-----------|----------|----------|------|------|------|------|------|------|-----|-----|------|
| 0 | 06Feb1996 | 08:51:07 | 00:13.71 | 70.4 | 74.8 | 86.1 | 92.1 | 81.8 | 0 | 0 | N | 0.0 |
| 1 | 06Feb1996 | 08:51:07 | 00:13.71 | 70.4 | 74.8 | 86.1 | 92.1 | 81.8 | 0 | 0 | N | 0.0 |
| 2 | 06Feb1996 | 08:54:31 | 00:11.56 | 68.6 | 72.6 | 83.3 | 88.2 | 79.2 | 0 | 0 | N | 0.0 |
| 3 | 06Feb1996 | 08:58:19 | 00:10.12 | 68.8 | 72.2 | 82.4 | 91.7 | 78.8 | 0 | 0 | N | 0.0 |

Figure 20. Data Conversion window.

create it for you. The NOISECHECK formatted daily files will be default named using the convention TSSYMMDD.TTT where T is the type of file (E or I), SS is the site number, Y is a one character digit for the year, M is the hexadecimal month and DD is the day of the month. The file naming field displays the format. If this field is changed, the file will be named the actual text in the field.

The monthly files are named CCCSYMM.TTT where CCC is the Air Base Code, SS is the site, and YMM is the year and month.

Once all the parameters are set, pressing the Run button will create NOISECHECK II formatted data files from the raw data and save them in the Output Directory. The file contents field will display statistics on the file conversion after the processing is finished.

After completing the file conversion, any of the raw or converted data files can be viewed in the File Contents field by using the Open Button and accessing the appropriate file with the NOISENET directory service.

Once you are done with converting data, you can close this window by pressing the Close button.

The DNL files are not processed at this stage. Instead they need to be transferred to the directory that the reports section will be using. The LD820 does not produce a DNL file.

BEAR Event Calendar (Figure 21)

The BEAR Event Calendar window is for creating a calendar (or log) of events from BEAR event data. This report is very helpful in determining the BEAR monitor up/down time. It lists the date, the first, last and number of events for each day, the estimated hours the BEAR recorded voltage records for the day (four times the number of voltage records), the number of events downloaded for each day, the total number of bytes created from records downloaded, and the first and last event date downloaded each day.

The Current Date and time fields are not selectable.

The Directory Link will automatically change the associated directories if selected. This is assuming a specific file structure and directory structure. NOISENET assumes that

the directories will be under the current project and be by site (i.e.. 01, 02, 03, etc..), by year-month (i.e. for Aug through Oct of 1996 use 9608, 9609, 9610).

The Site selection will automatically update the File Filters. The filters are used when processing the events.

The Event Directory is the current event directory to be processed. The Prev and Next directories are for the previous month and the next months event data. This is so the event records overlap appropriately.

When the Event directory is changed using the Set button, the previous and next directories are automatically changed to be the same as the event directory. By changing the directory name with the mouse and keyboard, this shortcut can be avoided.

If valid booms are copied (not moved!) to the valid booms directory, the first, last, and number of valid booms for each day will also be listed.

The voltage directory is where the downloaded voltage files are stored. If the voltage files are not read properly, use the Set button each time you select a different voltage file directory. If the project extends over 10 months, the voltage files need to be separated by year. However, when calculating for December and January, you need to use a copy of the voltage file from the Previous or Next month in the current voltage directory.

The Current Directory is where the output is sent.

The File name is automatically updated when the event directory is changed. The naming convention is ID####.CAL where ID is the project ID and #### are the last four characters of the event subdirectory.

The current calendar file contents can be updated by clicking on the Open button. The data can be edited and saved.

The Process button creates the Event Calendar file from the selected data.

Bear Event Calendar from Files

Current Date: Time: 14:15:57

Directory Link: ☒ Event=Volts ☐ Boom=Out

Site: 01 Site Name: OEBN_Trailer

| Input | Directory | | File Filters |
|---------|--------------------------|-----|--------------|
| Event | C:\AIRFORCE\NOISENET\WPA | Set | b*.* |
| Prev | C:\AIRFORCE\NOISENET\WPA | Set | |
| Next | C:\AIRFORCE\NOISENET\WPA | Set | |
| Booms | C:\AIRFORCE\NOISENET\WPA | Set | b*.* |
| Voltage | C:\AIRFORCE\NOISENET\WPA | Set | v*.* |

Output: Current Directory: C:\AIRFORCE\NOISENET\WPA File Name: WPA6.cal96

Current File Contents: None

Buttons: Process, Open, Save, Continue, Help, Print Screen

Figure 21. BEAR Event Calendar window.

BEAR Site to Site Correlation (Figure 22)

The BEAR site-to-site window is for correlating BEAR event data with respect to time and date. Whenever multiple events occur within the selected time window at a single site or multiple sites, the event is listed in the correlation file.

Site-to-Site Correlation

Current Date: 01

Current Site: 01

Site Name: OEBN_Trailer

Current Site Directory: c:\airforce\noisenet\wpa\01\

Window Minutes: 10

Output File: WPA964.cor

Output Directory: c:\airforce\noisenet\wpa

☐ SubDirectories Link

Current Settings

- 1 01 OEBN_Trailer c:\airforce\noisenet\wpa\01\
- 2 02 Powell c:\airforce\noisenet\wpa\02\
- 3 03 Gilbert c:\airforce\noisenet\wpa\03\
- 4 04 Lee c:\airforce\noisenet\wpa\04\

Buttons: Process, Continue, Help, Print Screen

Figure 22. BEAR Site to Site Correlation window.

A multiple event is defined as having a unique site, time, and date with respect to the file name. A count of the files created within the same minute is displayed along with the highest file letter.

The current site selection is used for selecting the current site directory. By selecting the SubDirectories Link check box, the last subdirectory of the current site will be copied to all other sites whenever either the <ENTER> key is hit or another field is selected.

By clicking on an entry in the Current Settings field the selected site will be made current.

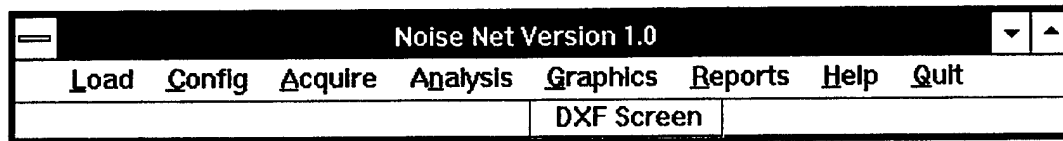


Figure 23. Graphics menu.

DXF Base Map Display (Figure 24)

The Graphics Screen is for displaying the Community Base Map, community features, noise monitor sites, and complaint locations.

The Graphics Screen displays files created using the DXF format. When the window is first activated, the most recently displayed DXF files are read and displayed.

The arrow keys will pan the screen while Page up and Page down are the zoom keys. The Home key restores the drawing to zoom all. The + and - keys are for adjusting the pan increments and zoom magnification.

The following menu options are available:

DXF File:

Under the DXF File Menu, opening a file clears the current DXF drawing and opens the selected drawing. Adding a file reads in the selected file and includes the file in the current drawing.

Print/Plot:

The Print/Plot Menu is for sending either a screen dump or the drawing area to the Windows Print Manager. For further information on screen dumps, see the help for Print Screen.

Display:

The Display Menu is for controlling the DXF display. The zoom in, zoom out, and zoom all functions are also accessible through the Page Up, Page Down, and Home Buttons respectively. The "+" and "-" keys increment a multiplier for the amount of zoom. Zoom All will fully display the drawing.

The Layers Menu item is for changing the layer color and turning the layers on and off. Individual items cannot be selected. Further information on layers is in the Layers Help Screen.

Specific Points:

The Specific Points Menu activates the window for editing the location and appearance of sites, community features, and complaints. The Site Information, Community Features, and Complaints Menu items in the Acquire Menu group are for adding specific points to NOISENET. Further help is available under Specific Features Help and the various Acquire items.

Tool Bar:

The Tool Bar displays the distance in feet from the reference point and the Lat/Long of the cursor. The map locations will be correctly displayed only if the DXF drawing is in the units of feet.

Under NOISEMAP 6.4 and earlier, the DXF output is displaced by 100,000 feet horizontally and 200,000 feet vertically. Thus, you may have to edit the NMPlot DXF file to remove this offset in order for NOISEMAP graphics to display properly in NOISENET.

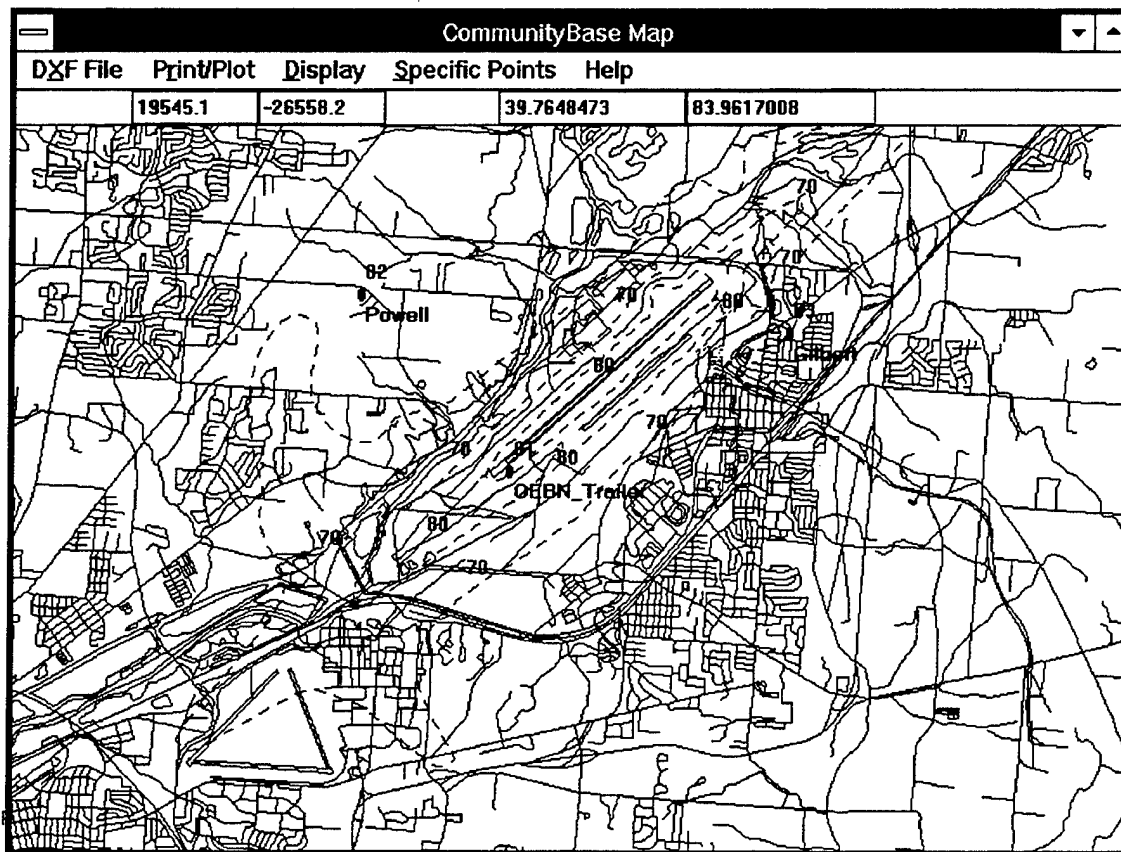


Figure 24. Community Base Map graphics window.

Layer Color and Control

The DXF layer colors and display status (on/off) can be changed in this window. Whenever a layer is frozen, it is not displayed but still exists in memory.

The pull-down menu is for selecting which layer is current. The list on the right side displays the current layer settings where (F) represents frozen. The currently available

layers are listed below the layer lists. Most drawings will have a "0" layer even if there are no items in the layer.

Further information on layers can be found in most drawing program's documentation such as AutoCad.

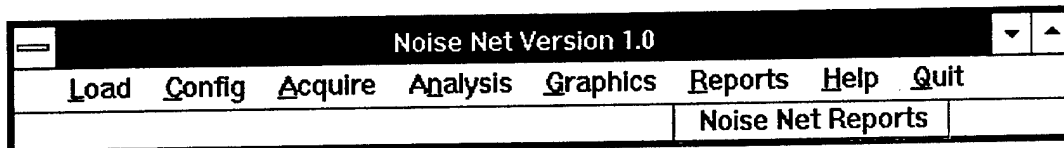


Figure 25. Reports menu.

Report Generator (Figure 26)

This window is a basic report generator for creating detailed summary reports of the noise data. Currently, reports are only generated from data stored in the NOISENET/NOISECHECK text file format.

These reports can serve a variety of purposes and are therefore customizable.

You can specify the header information you want to include by clicking on the appropriate check boxes. You must select the monitoring site you want a report on by selecting from the drop-down list in the upper right portion of the window. Specify a start and stop date in the appropriate fields. A start and stop date must be specified.

If needed, you can specify other pertinent information in the report header by checking the box next to the empty text field and entering your information in the text field.

In the Columns selection area, select the details you wish to appear in the report. Similarly, for Exceedance, Interval, and Summary reports specify the noise metrics that

Generate Report Window

Header Current Date **04/15/96** Time **12:10:02**

☒ Base Description ☒ Current Date
☒ Site Number ☒ Site Name ☒ Site SN Site **01** ↓ OEBN_Trailer
☒ Site Address
☒ Start/End Date Start Date **04/15/96** End Date **04/15/96**
☐ Text

| Columns | Exceedance | Intervals | Summary | |
|--|---|--|--|---|
| <input checked="" type="checkbox"/> Count | <input checked="" type="checkbox"/> Leq | <input checked="" type="checkbox"/> Leq | <input checked="" type="checkbox"/> Hourly | Excd |
| <input checked="" type="checkbox"/> Date | <input checked="" type="checkbox"/> L Max | <input checked="" type="checkbox"/> Lmin | <input checked="" type="checkbox"/> Daily | Intv |
| <input checked="" type="checkbox"/> Time | <input type="checkbox"/> Peak | <input checked="" type="checkbox"/> Lmax | <input checked="" type="checkbox"/> Interval | Summary |
| <input checked="" type="checkbox"/> Duration | <input type="checkbox"/> UWPeak | <input checked="" type="checkbox"/> Peak | <input checked="" type="checkbox"/> Exceedance | Continue |
| <input checked="" type="checkbox"/> SLM SN | <input checked="" type="checkbox"/> SEL | <input checked="" type="checkbox"/> UWPeak | <input checked="" type="checkbox"/> Downloaded HNI | Help |
| | <input type="checkbox"/> Excd 2 | <input checked="" type="checkbox"/> SEL | <input checked="" type="checkbox"/> Leq | Set |
| | <input type="checkbox"/> Ovid | <input checked="" type="checkbox"/> Lnn | <input checked="" type="checkbox"/> Ldn | Set |
| | | | <input checked="" type="checkbox"/> CNEL | Print Screen |

Start File Filter ?0160415.exc/int ☒ Daily
 Input Directory c:\airforce\noisenet\wpa\data
 Output Directory c:\airforce\noisenet\wpa\data

Figure 26. Report Generation window.

you want to appear in the report. By default, all details and noise metrics are presented in the reports. You can filter the raw data files by using the Start File Filter.

When NOISENET converts the Larson-Davis Exceedance and Interval data, it creates a file for each month and a file for each day for both the Exceedance and Interval data. the Start File filter will tell NOISENET which naming format to use when searching the files for requested data. By selecting the Monthly or Daily file naming convention, the time to search for data can reduced.

The Input Directory is where the data converted to the NOISECHECK format is stored. If you are processing the daily statistics for a summary report for a LD870, the raw

Interval Report

Output

report.txt c:\airforce\noisenet\wpa\data

Contents

Interval Report

Field Demonstration

Current Date:04/15/96 Time:12:12:30

Site:01 SN:0 OEbn_Trailer

Address:

:Bart_Elias

:2610_7th_Street

:WPAFB_Ohio

Owner Phone 255-3675

Modem 9-286-3686Y

Start Date:02/02/96 End Date:02/20/96

| Cnt | Date | Time | Duration | SN | LEQ | Lmax | UwPk | SEL |
|-----|-----------|----------|----------|----------|------|------|------|------|
| 0 | 06Feb1996 | 08:48:46 | 00:04.50 | 870A0174 | 49.7 | 51.7 | 78.4 | 56.2 |
| 1 | 06Feb1996 | 08:48:46 | 00:04.50 | 870A0174 | 49.7 | 51.7 | 78.4 | 56.2 |
| 2 | 06Feb1996 | 08:50:59 | 09:00.53 | 870A0174 | 58.5 | 74.8 | 92.1 | 85.8 |
| 3 | 06Feb1996 | 09:00:00 | 1:00:00 | 870A0174 | 55.7 | 79.4 | 97.3 | 91.3 |

Printer Open Save Continue Help

Figure 27. Report output window.

DNH files need to be transferred to this directory. Specify, the Output Directory where the reports will be stored and press the set button. If this directory does not exist, NOISENET will create it for you.

Once all the parameters are set, generate an Exceedance Report by pressing the Excd button, an Interval Report by pressing the Int button, and a Summary Report by pressing the Summary button.

The Report will be generated in a Report Editor Screen. NOISENET will not automatically name or write the report to disk unless the report exceeds 32 Kbytes. Instead, you must name the file in the File Name Field in the Report Editor Screen and

press Save. NOISENET has a limit of 32 Kbytes for the text field in the screen editor. If this is exceeded, you will be notified of the error and the data below 32 Kbytes will be displayed. You may either select a shorter data range, or less fields. You may also consider loading the data directly into a standard spreadsheet or word processor. As an additional option, you may create a report generator program for a specific type of report and add it to the NOISENET Setup.

Once you are done creating the reports you want, you may exit this window by pressing the Continue button.

Known Bugs and Problems

The following is a list of several problems or bugs that may occur in NOISENET.

When running the LD870 program, there may be a message that will ask for the runtime module. This is referring to the BRUN45.EXE file and is the result of the program being compiled with the switch to not include the runtime file. The system is basically checking the system path and current directory. The best thing to do is to put the BRUN45.EXE file in either the \DOS, a \UTIL directory, or the directory that the executable program is running in. The BRUN45.EXE helps reduce the size of the executable and enables data sharing between BASIC program modules.

All text editor fields in NOISENET have a maximum capacity of 32k. Strange things may happen when the error checking misses when the text size exceeds this limit.

Whenever NOISENET calls upon a DOS program from the Download and Time windows, NOISENET is placed in a Waiting Mode for the DOS program to terminate and the screen to close. This prevents a COM port from being opened while it is already in use. If you try to switch between open windows whenever NOISENET is in this waiting state, the system may crash or become non-responsive. For this same

reason, NOISENET does not currently work with Windows 95 because whenever the DOS program is finished, the window goes into a program terminated mode with the window remaining open and control returned to NOISENET. However, NOISENET is still waiting for the window to close before it proceeds.

If the Reports section gives a GP fault while building a report, the problem may simply be the report is too large and the error checking missed the overflow. Try only about a weeks worth of data if the hourly data is being reviewed. If you get repetitive messages concerning the report being too large, this is normal. For each 32k group a warning message will appear, the report will be written to disk, and only the first 32k of the report will be displayed. You may access the formatted data directly without creating a report after running the LD to NOISECHECK conversion function.

One minor problem with the Directory Service is that the displayed path may not agree with the current drive whenever the current drive is different from the NOISENET drive. Select a different drive then select the current drive.

Please feel free to send information on new problems and suggestions by sending your comments to either:

Bart Elias: BAE@osprey.al.wpafb.af.mil

or

Alan Dent: WyleResearch@earthlink.net

FIELD DEMONSTRATION

In order to assess the functioning of the NOISENET system software in a full-scale field implementation, a field demonstration of the NOISENET noise management system was conducted at Wright-Patterson AFB, OH (WPAFB) from 5 Feb - 16 Feb 1996. The system was tested by installing four remote noise monitors, one LD 870 and three LD 820s at various locations in the community surrounding Patterson Field. Modem communications with the noise monitors was implemented through both standard telephone line and cellular communications. Noise and weather data were collected over the two week period. These data were compared against actual flight operations data obtained from WPAFB Base Operations and existing noise forecasts obtained from WPAFB Civil Engineering. The accuracy of the NOISENET geographic display features was verified using Global Positioning Satellite (GPS) receiver measurements taken at the four monitoring sites. The geographic positions obtained from GPS measurements for each of the four monitoring sites is shown in Table 3 and the geographic display from NOISENET of the WPAFB area indicating the monitoring sites for the field demonstration is presented in Figure 28.

Table 3. Site Information.

| SITE #: | SITE NAME: | MONITOR: | LATITUDE: | LONGITUDE: |
|---------|------------------|----------|--------------|--------------|
| 01 | OEBN Trailer | LD 870 | 39.8140888 N | 84.0642309 W |
| 02 | Powell House | LD 820 | 39.8371808 N | 84.0906378 W |
| 03 | Mary Help School | LD 820 | 39.8321911 N | 84.0148181 W |
| 04 | Lee House | LD 820 | 39.7296814 N | 84.0276183 W |

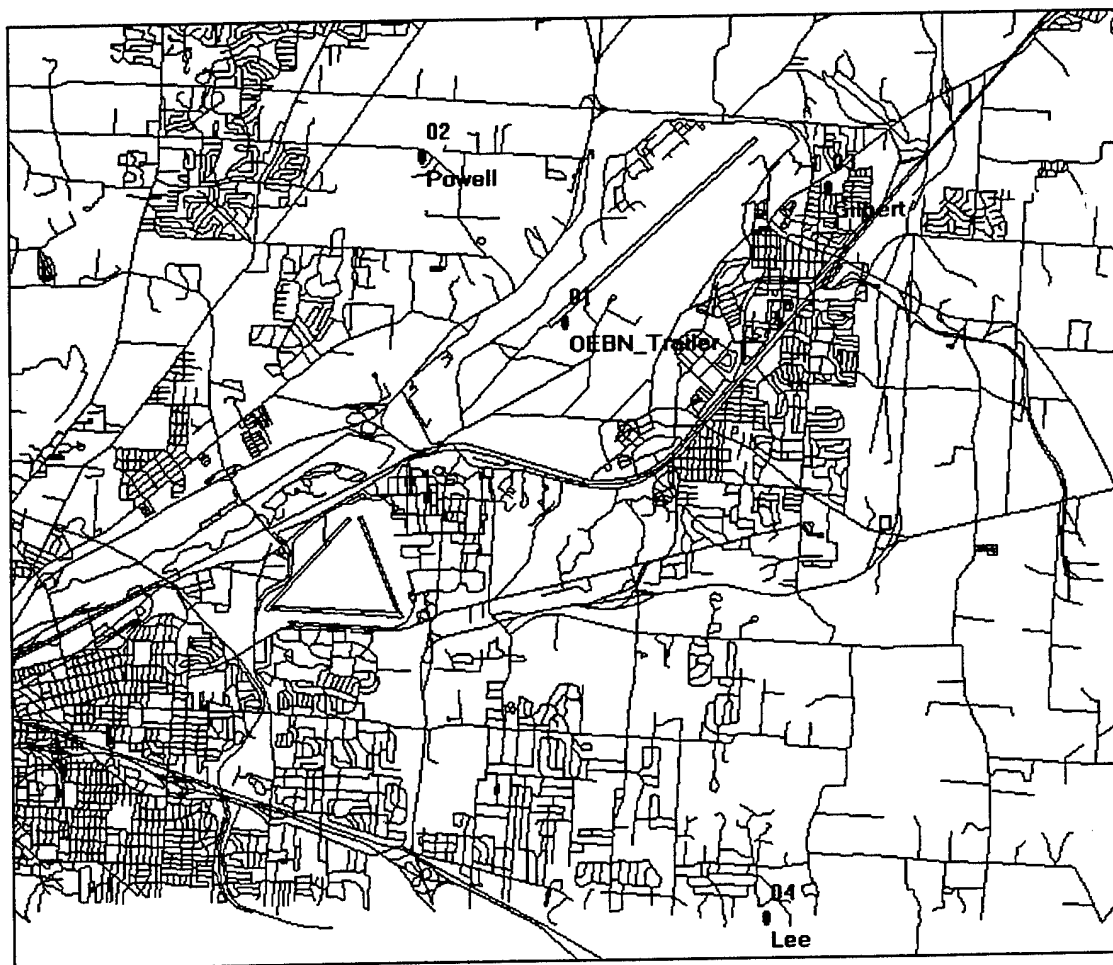


Figure 28. Geographic area map depicting noise monitoring locations for the field demonstration.

While this field demonstration did not consist of a formal NOISECHECK II procedure for assessing noise levels and verifying predicted site noise levels, the data presented below provides a sense of the types of information and reports that can be obtained through a NOISENET noise monitoring project. Appendix II gives an example of NOISECHECK II formatted EXCEEDANCE, INTERVAL, and SUMMARY DATA reports converted from raw data from the Larson Davis noise monitors used in the field demonstration. Appendix III provides examples of the noise data reports that can be created directly through the NOISENET report generation capabilities. Both the NOISECHECK II formatted data files or the NOISENET reports are in columnar format and are easily imported into most popular spreadsheet and statistical software

packages. In this field demonstration, both NOISECHECK II formatted files and NOISENET reports were input into the Microsoft Excel and Stat-Soft Statistica software programs for further analysis. The summary statistics reported in the figures and tables below are the product of these analyses and are representative of the types of information that can be obtained from data collected during a NOISENET monitoring effort.

Table 4. Daily LEQs.

| DAY | SITE 01 | SITE 02 | SITE 03 | SITE 04 |
|-----------|---------|---------|---------|---------|
| 6 Feb 96 | 67.2 | 51.3 | 55.9 | 46.2 |
| 7 Feb 96 | 61.5 | 48.7 | 58.5 | 47.6 |
| 8 Feb 96 | 62.9 | 54.1 | 56.2 | 52.0 |
| 9 Feb 96 | 62.3 | 67.8 | 55.0 | -- |
| 10 Feb 96 | 63.0 | 56.4 | 57.7 | 50.6 |
| 11 Feb 96 | 64.2 | 52.6 | 55.4 | 49.3 |
| 12 Feb 96 | 61.5 | 59.0 | 55.8 | 46.2 |
| 13 Feb 96 | 59.3 | 51.7 | 55.3 | 47.2 |
| 14 Feb 96 | 64.5 | 47.1 | 57.5 | 47.5 |
| 15 Feb 96 | 45.8 | 45.9 | 49.1 | 40.9 |

Table 5. Average Hourly LEQs

| HOUR | SITE 01 | SITE 02 | SITE 03 | SITE 04 |
|------|---------|---------|---------|---------|
| 0000 | 52.7 | 51.9 | 49.2 | 44.0 |
| 0100 | 53.1 | 51.8 | 48.1 | 43.7 |
| 0200 | 51.2 | 50.5 | 50.2 | 43.0 |
| 0300 | 50.6 | 51.5 | 53.0 | 43.3 |
| 0400 | 53.3 | 44.2 | 49.3 | 46.6 |
| 0500 | 56.7 | 59.1 | 57.5 | 47.7 |
| 0600 | 59.2 | 50.5 | 56.7 | 48.1 |
| 0700 | 57.4 | 50.1 | 55.5 | 48.5 |
| 0800 | 61.5 | 49.3 | 61.4 | 50.3 |
| 0900 | 61.7 | 53.7 | 56.8 | 50.8 |
| 1000 | 70.4 | 57.8 | 60.6 | 50.5 |
| 1100 | 71.8 | 51.4 | 65.3 | 51.5 |
| 1200 | 71.3 | 54.8 | 66.3 | 50.9 |
| 1300 | 72.3 | 57.8 | 63.3 | 50.2 |
| 1400 | 68.7 | 56.6 | 59.7 | 52.1 |
| 1500 | 63.6 | 61.3 | 58.9 | 52.1 |
| 1600 | 58.2 | 58.3 | 55.8 | 51.0 |
| 1700 | 68.6 | 60.9 | 57.7 | 50.8 |
| 1800 | 70.8 | 57.1 | 58.1 | 47.0 |
| 1900 | 68.7 | 56.3 | 57.2 | 47.9 |
| 2000 | 66.3 | 56.4 | 55.6 | 46.8 |
| 2100 | 66.2 | 56.8 | 54.6 | 48.1 |
| 2200 | 59.9 | 56.2 | 52.5 | 46.5 |
| 2300 | 58.3 | 53.0 | 52.1 | 44.6 |

Table 6. Site LEQ and LDN Metrics.

| SITE | LEQ | LDN |
|------|------|------|
| 01 | 62.4 | 66.0 |
| 02 | 54.8 | 58.4 |
| 03 | 56.2 | 60.0 |
| 04 | 48.1 | 51.8 |

APPENDIX I
DESCRIPTION OF THE LARSON-DAVIS NOISE MONITOR
COMMUNICATIONS PROGRAMS

Comments Concerning the LD870_DL and LD820_DL Programs

The comments in this file were written for the LD870_DL program; thus, all references are to the LD870_DL program and the LD870 Sound Level Monitor. However, since the LD820_DL program is almost identical, the comments in this file will also apply to the LD820_DL program and the LD820 Sound Level Monitor except as noted here. The following items do not apply to the LD820 or are different for the LD820:

- 1) The LD820 setup parameter #154 (S154) must always be set to "NO" because the LD820's with firmware version .145 dated 04 Dec 1992 do not respond to the logon procedure described in the manual. For the LD820 the modem answers the phone without any interaction with the LD820. The LD870 logon follows the procedure in the manual.
- 2) All references to cellular phone connections do not apply to the LD820. The LD820 has not been tested with a cellular phone.
- 3) The 75 second redial delay is only 15 seconds for the LD820.
- 4) The modem on the LD820 end must be set to initialize to "X4 E0 V0 Q0 S0=1". The modem can be set with these values which can then be saved with the &W modem command.
- 5) The LD820_DL program was tested with LD820 firmware version 0.145 dated 04 Dec 1992. The unformatted data for this firmware version are downloaded in spreadsheet compatible format.

- 6) All file names containing LD870 or 870 should be changed to 820 when working with the LD820_DL program.

The LD870_DL.BAS program is the auto download version of the LD870 control program. This program can be used to download reports from the LD870, reset all LD870 parameters or reset/clear all LD870 data histories. It can be used with a direct computer serial port connection, with a regular modem connection or with a cellular phone connection. The baud rate is currently set at 2400 when used with a modem connection because of problems with the LD870 logon procedure. This default baud rate can be changed by changing variable "modem.baud.rate.index%" in the source code and recompiling the program. For direct connection the program will open the serial port at the baud rate set in the LD870 setup parameter #9 (S9); the maximum baud rate is currently 9600.

This auto-download version of the LD870 program displays some regular text to the display to indicate the status of the current operations, but no operator responses are requested or permitted. There are no graphics calls and all displays are in 80 characters per line mode. All program responses to the display could be eliminated; they are there only to indicate the status of the current operations.

This LD870_DL auto-download program is normally executed as a stand alone program with command line input containing the site number and the EXC, INT, SUM, DNH, RCL, RST and/or RSA flags to control which reports are downloaded and what type LD870 reset option is executed. The LD870_DL can also be executed from the menu driven LD870M program which uses the BASIC chain command to execute this LD870_DL program. When the LD870_DL program is executed from the LD870M program, the command line flags are set in the LD870M program and are carried to the LD870_DL program via shared blank common. Note that when the LD870_DL program is chained from the LD870M program to perform the auto-download only the EXC, INT and SUM data reports are downloaded; the DNH and RCL reports are not included. This can be changed if all reports are required. After the download is complete, the

LD870_DL program chains back to the menu driven LD870M program. See the LD870M.DOC file or comments at the beginning of each program for more information. Command line options may be entered in upper or lower case and at least one option must be entered or the program will terminate immediately.

The use of the BASIC chain command and the sharing of blank common between the LD870M and LD870_DL programs can be done only when the two programs are compiled using the QuickBASIC option where the EXE files require the BRUN45.EXE file. The stand-alone EXE files will not carry common variables between the two programs. Thus the BRUN45.EXE file must be in the subdirectory with the EXE files or on the DOS path. If the chaining is never used, the programs may be compiled in the stand-alone mode.

When the LD870_DL auto-download program is executed as a stand alone program in the normal auto-download mode, the sample execution statement described below includes a complete list of all command line options. This sample command line is split into two lines here but it must be entered as one line with a space after the executable file name and a space between each parameter. The maximum length of the command line is 128 characters which does not include the program file name (LD870_DL here).

```
LD870_DL site.number$ COM1: INT EXC SUM WXD DNH RCL RST RSA  
SU:LD870SET.DAT LF:S01LOG.DAT PH:9,476-7874
```

where:

site.number\$ - site number from which data are to be downloaded. The site number must be the first two characters on the command line (07 above). The site number may be alphanumeric and must be the same as the site number stored in parameter S5 in the LD870 (the first two characters in S5).

- COM1: - COM port opened to dial modem. The COM port name must be included if something other than the default "COM1:" is used. The COM port entry must be COM1:, COM2:, COM3:, or COM4:.
- INT - download interval report
- EXC - download exceedance report
- SUM - download summary report
- WXD - download weather data file (not currently used - weather data are taken from the interval and/or exceedance reports).
- DNH - daily noise history report
- RCL - run/stop and cal log report
- FMT - download formatted data reports (default is unformatted when FMT is omitted from the command line).
- RST - reset all data histories using the LD870 M8 command if report downloads are complete.
- RSA - reset all data and input new setup parameters from the LD870 setup file only if report downloads are complete.
- SU: - the LD870 setup file must be preceded by these three characters. Default is LD870SET.Snn, where "nn" is the site number read from the command line. The file names may include path information. This LD870 setup file is required only when the program resets/initializes the LD870. Note that if the default (LD870SET.Snn) and/or command line LD870 setup file is not found, the program will attempt to use file LD870SET.DAT as a second default.
- LF: - the LD870 output/log file name must be preceded by these three characters. Default is SnnLOG.DAT, where "nn" is the site number read from the command line. The file names may include path

information. This file serves as a log of download operations for the LD870_DL program. It will contain a list of all files downloaded as well as a record of errors or other download problems. This file may be deleted at any time; new data will be appended when the file already exists.

PH: - the phone number must be preceded by these three characters. If the phone number is omitted from the command line, the program will attempt a direct serial port connection to the LD870. If a modem connection is used, the LD870 setup parameter #154 must be set to "YES".

When a phone number is included on the command line, the program will attempt to dial the modem and log onto the LD870. If the first attempt to connect with the LD870 is unsuccessful, the program will redial up to four times at seventy-five second intervals. The seventy-five second delay should give the LD870 sufficient time to recycle and send the setup string to the modem. Also note that if a device I/O or time out error (or similar error) occurs during the LD870 logon process or during data transfer, the program may (depending on the error) attempt to redial a maximum of two times. To use the LD870 with a modem connection the LD870 Modem Mode parameter (S154) must be set to YES, the LD870 baud rate must be set to 2400 (parameter S9), and the Modem Setup String (parameter S158) must be set to "X4 E0 V0 Q0 S0=5". It might work best if the modem initializes to these settings. Note that the LD870 will not respond to a 9600 baud rate with a modem connection. A baud rate of 9600 can be used for a direct serial port connection. For a cellular phone connection, the phone number string must contain the character "Y" which triggers the program to set several time out parameters to larger values. The Microcom modems currently used for cellular connections also require the "Y" or "JKY" at the end of the phone number for a cellular connection.

Note that the first two characters of the "S5" Title parameter which is set up in the LD870SET.Sxx file must contain the two character LD870 site code. The remaining 28 characters can be used as needed. This site code is used by the LD870_DL program to define the report file names as described later in this documentation file.

When the LD870_DL "RSA" flag is included on the command line, the LD870_DL program will reset the LD870 memory and reinitialize the LD870 with the setup parameters stored in file LD870SET.Sxx. All parameters contained in this LD870SET.Sxx file are written to the LD870 with each initialization. Note that resetting the LD870 does not wipe out the setup parameters and thus this complete initialization file may not be required most of the time. The LD870 setup file can be defined to set up only those select parameters which are changed. When the "RST" command line flag is used, only the memory and histories are reset using the "M8" command.

The LD870SET.Sxx file must contain one record per "S" parameter. Each record must contain one "S" parameter and one comment string. The "S" parameter with the selected option must be enclosed in double quotes and the comment must be preceded by a single quote (e.g., "S66,1" 'Excd History Enable). No commas are permitted in the comment section. There is no set length for either part. The syntax of the "S" parameter must be as described in the LD870 Manual (or LD820 Manual) except that the version of the command using the semicolon and brackets (e.g., S66;[Yes]) would not work with the LD820's used to check out this program; this format worked just fine with the LD870's. Note that the current date and time are not setup from this file; these parameters are taken from the computer. This LD870SET.Sxx file may be updated as needed using any convenient ASCII editor. This LD870SET.Sxx file and the LD870_DL program were developed and tested with LD870 firmware version 0.835 dated 05 March 1992.

If the FMT command line option is used, the data reports are downloaded in formatted mode. Formatted data reports can be sent to a printer and are easy to read because data variables are identified. Unformatted data are downloaded with one

record per interval or one record per exceedance. Unformatted data are comma delimited and thus ideal for entry into a spreadsheet. The variable sequence in the unformatted records for a specific report will vary depending on the parameters set in the LD870 (for example, weather data versus no weather data or wind monitor versus no wind monitor, etc.). The easiest and maybe the only way to determine the location of variables in the unformatted records is to compare several formatted and unformatted records. Note that the Daily Noise History report can't be downloaded in unformatted mode for LD870's with firmware version 0.835 dated 05 March 1992. Unformatted data are in a spreadsheet compatible format for LD870's with firmware version 0.840 or later. Unformatted data for earlier firmware versions are downloaded with one variable per record or line.

The "delay!" variable, which is used in numerous pause calls throughout the program, is currently set to 0.6 seconds if the LD870 is not in modem mode and to 1.5 seconds when the LD870 is in modem mode. The modem mode parameter as used here is set to "YES" if a phone number is read from the command line; otherwise it is set to "NO". These two delay times appear to work very well in direct connect mode at 9600 baud and in modem mode at 2400 baud. There are also many calls to the PAUSE routine where other delay times are used for that specific call. Many of these PAUSE times have not been fine tuned and may be larger than necessary for this latest version of the LD870 firmware. The LD870 has worked very well with the current settings.

In May 1992, the LD870 was tested with a cellular phone and cellular modem connection. Since the cellular phones/modems may frequently give no response for as long as several seconds, the LD870 program timed out in numerous time out loops in the "transfer" and "read.LD870" routines. To avoid this time out problem, a "read.timeout!" variable was added to the program and the time out loops were changed to measure a specific time in seconds. This also eliminated the variations due to computer speed. Variables "read.timeout.sec.init!" and "read.timeout.sec!" were added to the program to set the "read.timeout!" variable for the program initialization

phase and for the regular operation of the program. A long time out during the baud rate selection did not work properly. A "read.timeout!" of 0.4 seconds appears to work fine for a regular phone/modem or direct line connection. For a cellular phone/modem connection, 1.3 seconds during initialization and five to six seconds during normal operation appear to work okay (this may need additional fine tuning). As of February 1996, the program checks the phone number string for a "Y" or "y" and if found assumes a cellular connection and sets the above parameters accordingly. Cellular phone numbers used with the Microcom modems should include "JKY" or "Y" as the last character(s) in the phone number.

This LD870_DL program will download five different types of reports or data histories. The report names and standard file names are listed below:

- a) The Daily Noise History Report is downloaded to file SnnDNH.Dxx where "nn" is the site number and "xx" is the sequence code for multiple files.
- b) The Exceedance Report is downloaded to file SnnEXC.Dxx.
- c) The Run/Stop and Cal Log Report is downloaded to file SnnRCL.Dxx.
- d) The Interval Report is downloaded to file SnnINT.Dxx.
- e) The Summary Report is downloaded to file SnnSUM.Dxx.

To determine the "nn" file sequence code, the program first finds the largest sequence number for the existing INT, EXC, SUM, DNH and RCL data files. Next the program attempts to open a new file with a sequence number one larger than this largest existing sequence number. If sequence code 99 already exists, the program starts at 00 and searches for the first available sequence code. If all 100 possible file extensions already exist, the program prints an error message in the LOG file and skips the download. Note that sequence number may be and usually will be different for each data type.

When the LD870_DL program downloads a report, the number of bytes downloaded are counted and compared with the expected number of bytes for the number of records being downloaded. If the number of bytes is considerably less than expected, the program will write a message to the LD870 output log file and the RAS or RST option will not be executed. This expected byte count is currently set up for the unformatted data; it does not take into account the numerous different output options for exceedance and interval data. This byte count comparison is not very accurate, especially for the interval data, and may need to be fine tuned or omitted if it creates problems. For the interval data, the byte count is setup for the regular interval information plus the weather and wind variables. The expected byte count does not include the six Ln's; thus, if the Ln's and all weather data and/or wind data are not included in the interval report, the program may indicate the report is incomplete when in fact it is okay.

In summary, the files required to execute the LD870_DL program are:

- LD870SET.Snn -- LD870 setup data file (nn is site number). File LD870SET.DAT is a second default if file LD870SET.Snn is not found. This file is required only if the initialize option is selected from the main menu.
- LD870_DL.EXE -- LD870 auto-download executable.
- BRUN45.EXE -- QuickBASIC file required with above EXE's. File must be in the above subdirectory or on the path.

To run and/or compile the LD870_DL.BAS program in the QuickBASIC environment the following files are required:

- QBB_LIBD.BAT -- loads the LD870_DL.BAS program and libraries
- LD870LIB.LIB -- LD870 QuickBASIC library
- LD870LIB.QLB -- LD870 QuickBASIC library
- LD870_DL.BAS -- LD870 source file

LD870SET.Snn -- LD870 setup data file ("nn" is site number read from the command line); see above comments.

Some additional information may be included in the comments at the beginning of the LD870_DL.BAS program.

Brief Comments Concerning the LD870_DL Program

The LD870_DL.BAS program is the auto-download version of the LD870 control program. This auto-download program is normally executed with command line input containing the site number and the EXC, INT, SUM, DNH, RCL, RST and/or RSA flags to control which reports are downloaded and what type LD870 reset option is executed. The LD870_DL can also be executed from the menu driven LD870M program in which case only the EXC, INT and SUM data reports are downloaded; the DNH and RCL reports are not included. This can be changed if all reports are required. After the download is complete, the LD870_DL program chains back to the menu driven LD870M program.

When the LD870_DL auto-download program is executed as a stand alone program in the normal auto-download mode, the sample execution statement described below includes a complete list of all command line options. This sample command line is split into two lines here but it must be entered as one line with a space after the executable file name and a space between each parameter. The maximum length of the command line is 128 characters which does not include the program file name (LD870_DL here). There is no maximum length for the file name and phone number entries (SU:, LF: & PH:) as long as the total command line does not exceed 128 characters.

```
LD870_DL site.number$ COM1: INT EXC SUM WXD DNH RCL RST RSA FMT  
SU:LD870SET.DAT LF:S01LOG.DAT PH:9,XXX-XXXX
```

where:

site.number\$ - site.number\$ from which data are to be downloaded. The site.number\$ is always required and must be the first two alphanumeric characters on the command line.

COM1: - COM port opened to dial modem (required only when not equal to COM1:)

INT - download the interval report

EXC - download the exceedance report

SUM - download the summary report

WXD - download the weather report (not currently defined - weather data are taken from the interval and/or exceedance reports).

DNH - download the daily noise history report

RCL - download the run/stop and cal log report

RST - reset all data histories if report downloads are complete.

RSA - reset all data and input new setup parameters from the LD870 setup file only if report downloads are complete.

FMT - download data in a printer format (default is unformatted - omit FMT). The Daily Noise History report can't be downloaded in unformatted mode for the LD870's with firmware version 0.835. Unformatted data are in a spreadsheet compatible format for LD870's with firmware version 0.840 or later. Unformatted data for earlier firmware versions are downloaded with one variable per record or line.

SU: - the LD870 setup file name must be preceded by these three characters. The default setup file name is LD870SET.Snn, where "nn" is the site number read from the command line. The file name may include path information.

LF: - the LD870 output/log file name must be preceded by these three characters. Default is SnnLOG.DAT, where "nn" is the site number read from the command line. The file names may include path information.

PH: - the phone number must be preceded by these three characters. If the phone number is omitted from the command line, the program will attempt a direct connection to the LD870. If a modem connection is used, the LD870 setup parameter #154 must be set to "YES". For a cellular phone connection, the phone number string must contain the character "Y" which triggers the program to set several time out parameters to larger values.

Command line options may be entered in upper or lower case and at least one download or reset option must be entered or the program will terminate immediately. Except for the "site.number\$" which must be the first two characters on the command line, all command line parameters are optional and may be entered in any sequence.

Note that if the default (LD870SET.Snn) and/or command line LD870 setup file is not found, the program will attempt to use file LD870SET.DAT as a second default. Each record/line in the LD870 setup file must contain one setup parameter enclosed in double quotes followed by a comment which starts with a single quote; no commas are permitted in the comment section.

When a phone number is included on the command line, the program will make a maximum of four attempts to connect with the modem before aborting the job. If a device I/O or time out error (or similar error) occurs during the dial in process or during data transfer, the program may (depending on the error) attempt to redial a maximum of two times.

The interval, exceedance, summary, daily noise history, and run/stop and cal log files are stored in data files with the following standard file name format: SxxINT.Dnn, SxxEXC.Dnn, SxxSUM.Dnn, SxxDNH.Dnn and SxxRCL.Dnn. Where:

xx is the two digit site code,

nn is the file sequence number for each file type. (nn must be in the range 00 to 99)

File SnnLOG.DAT is an output file written to the current subdirectory by the LD870_DL program where "nn" is the LD870 site number; this is the default file name.

If this default file name is not acceptable, this output log file name (plus the DOS path as needed) may be entered from the command line as described above (see command line input). One SnnLOG.DAT file will be written for each site from which data are downloaded. This file serves as a log of download operations. It will contain a list of all files downloaded as well as a record of errors or other download problems. This file may be deleted at any time; new data will be appended when the file already exists.

Brief Comments Concerning the LD820_DL Program

The LD820_DL.BAS program is the auto-download version of the LD820 control program. This auto-download program is normally executed with command line input containing the site number and the EXC, INT, SUM, DNH, RCL, RST and/or RSA flags to control which reports are downloaded and what type LD820 reset option is executed. The LD820_DL can also be executed from the menu driven LD820M program in which case only the EXC, INT and SUM data reports are downloaded; the DNH and RCL reports are not included. This can be changed if all reports are required. After the download is complete, the LD820_DL program chains back to the menu driven LD820M program.

When the LD820_DL auto-download program is executed as a stand alone program in the normal auto-download mode, the sample execution statement described below includes a complete list of all command line options. This sample command line is split into two lines here but it must be entered as one line with a space after the executable file name and a space between each parameter. The maximum length of the command line is 128 characters which does not include the program file name (LD820_DL here). There is no maximum length for the file name and phone number entries (SU:, LF: & PH:) as long as the total command line does not exceed 128 characters.

```
LD820_DL site.number$ COM1: INT EXC SUM WXD DNH RCL RST RSA FMT  
SU:LD820SET.DAT LF:S01LOG.DAT PH:9,XXX-XXXX
```

where:

site.number\$ - site.number\$ from which data are to be downloaded. The site.number\$ is always required and must be the first two alphanumeric characters on the command line.

COM1: - COM port opened to dial modem (required only when not equal to COM1:)

INT - download the interval report

EXC - download the exceedance report

SUM - download the summary report

WXD - download the weather report (not currently defined - weather data are taken from the interval and/or exceedance reports).

DNH - download the daily noise history report

RCL - download the run/stop and cal log report

RST - reset all data histories if report downloads are complete.

RSA - reset all data and input new setup parameters from the LD820 setup file only if report downloads are complete.

FMT - download data in a printer format (default is unformatted - omit FMT). Unformatted data are downloaded in a spreadsheet compatible comma delimited format.

SU: - the LD820 setup file name must be preceded by these three characters. The default setup file name is LD820SET.Snn, where "nn" is the site number read from the command line. The file name may include path information. See note below.

LF: - the LD820 output/log file name must be preceded by these three characters. Default is SnnLOG.DAT, where "nn" is the site number read from the command line. The file names may include path information.

PH: - the phone number must be preceded by these three characters. If the phone number is omitted from the command line, the program will attempt a direct connection to the LD820. Note that the LD820 modem mode setup parameter #154 must always be set to "NO"; the

current LD820's in the AL/OEBN inventory do not work with modem mode set to "YES".

Command line options may be entered in upper or lower case and at least one download or reset option must be entered or the program will terminate immediately. Except for the "site.number\$" which must be the first two characters on the command line, all command line parameters are optional and may be entered in any sequence.

Note that if the default (LD820SET.Snn) and/or command line LD820 setup file is not found, the program will attempt to use file LD820SET.DAT as a second default. Each record/line in the LD820 setup file must contain one setup parameter enclosed in double quotes followed by a comment which starts with a single quote; no commas are permitted in the comment section.

When a phone number is included on the command line, the program will make a maximum of four attempts to connect with the modem before aborting the job. If a device I/O or time out error (or similar error) occurs during the dial in process or during data transfer, the program may (depending on the error) attempt to redial a maximum of two times.

The interval, exceedance, summary, daily noise history, and run/stop and cal log files are stored in data files with the following standard file name format: SxxINT.Dnn, SxxEXC.Dnn, SxxSUM.Dnn, SxxDNH.Dnn and SxxRCL.Dnn. Where:

xx is the two digit site code,

nn is the file sequence number for each file type. (nn must be in the range 00 to 99)

File SnnLOG.DAT is an output file written to the current subdirectory by the LD820_DL program where "nn" is the LD820 site number; this is the default file name. If this default file name is not acceptable, this output log file name (plus the DOS path as needed) may be entered from the command line as described above (see command line input). One SnnLOG.DAT file will be written for each site from which data are downloaded. This file serves as a log of download operations. It will contain a list of all

files downloaded as well as a record of errors or other download problems. This file may be deleted at any time; new data will be appended when the file already exists.

Comments Concerning the LD870M and LD820M Programs

The comments in this file were written for the LD870M program; thus, all references are to the LD870M program and the LD870 Sound Level Monitor. However, since the LD820M program is almost identical, the comments in this file will also apply to the LD820M program and the LD820 Sound Level Monitor except as noted here. The following items do not apply to the LD820 or are different for the LD820:

- 1) The LD820 setup parameter #154 (S154) must always be set to "NO" because the LD820's with firmware version .145 dated 04 Dec 1992 do not respond to the logon procedure described in the manual. For the LD820 the modem answers the phone without any interaction with the LD820. The LD870 logon follows the procedure in the manual.
- 2) All references to cellular phone connections do not apply to the LD820. The LD820 has not been tested with a cellular phone.
- 3) The 75 second redial delay is only 15 seconds for the LD820.
- 4) The modem on the LD820 end must be set to initialize to "X4 E0 V0 Q0 S0=1". The modem can be set with these values which can then be saved with the &W modem command.
- 5) The LD820M program was tested with LD820 firmware version 0.145 dated 04 Dec 1992. The unformatted data for this firmware version are downloaded in spreadsheet compatible format.
- 6) All file names containing LD870 or 870 should be changed to 820 when working with the LD820M program.

The LD870M.BAS program is the menu driven version of the LD870 control program. This program can be used to download reports from the LD870, reset all LD870 parameters and reset/check individual parameters. It can be used with a direct computer serial port connection, with a regular modem connection or with a cellular phone connection. The baud rate is currently set at 2400 when used with a modem connection because of problems with the LD870 logon procedure. This default baud rate can be changed by changing variable "modem.baud.rate.index%" in the source code and recompiling the program. For direct connection the program will open the serial port at the baud rate set in the LD870 setup parameter #9 (S9); the maximum baud rate is currently 9600.

For this version of the program the command line input is optional when a direct serial port connection is used and when all default conditions and file names are acceptable. For a modem connection command line input is always required. The following sample command line contains all available command line parameters. Each parameter on the command line must be separated by a space including a space after the LD870M executable file name. The maximum length of the command line excluding the executable file name (LD870M) is 128 characters.

LD870M 07 COM1: SU:LD870SET.D07 LF:S07LOG.DAT PH:9,476-7874

The five command line input parameters for the LD870M.BAS program are described as follows:

- a) LD870 site number. The site number must be the first two characters on the command line (07 above). The site number may be alphanumeric and must be the same as the site number stored in parameter S5 in the LD870 (the first two characters in S5).
- b) COM port name. The COM port name must be included if something other than the default "COM1:" is used. The COM port entry must be COM1:, COM2:, COM3:, or COM4:.

- c) LD870 setup file name. This LD870 setup file is required only when the program resets/initializes the LD870. If command line input is used and the setup file name is not entered, the default file name is LD870SET.Snn where "nn" is the site number entered on the command line. If this setup file name is entered on the command line, the file name must be preceded by the characters "SU:" (without the quotes). If there is no command line input, the default setup file name is LD870SET.Snn where "nn" is the site number read from the LD870 using the "Q5" query parameter. The file name entered on the command line may include the DOS path as part of the file name when the path is needed to find the file. Note that if the default (LD870SET.Snn) and/or command line LD870 setup file is not found, the program will attempt to use file LD870SET.DAT as a second default.
- d) LD870 output/log file name. This log file name must be preceded by the characters "LF:" (without the quotes). If this output/log file name is not included on the command line, the default file name is of the form SnnLOG.DAT where "nn" is the site number entered on the command line. This output/log file name is not used by this LD870M program unless this program executes the LD870_DL program using the BASIC "CHAIN" command. The LD870_DL is executed only when Option 4 is selected from the Transfer Choices menu in this LD870M program. If there is no command line input, the default output/log file name is SnnLOG.DAT where "nn" is read from the LD870 using "Q5" query parameter. This file name may also include the DOS path as needed. This file serves as a log of download operations for the LD870_DL program. It will contain a list of all files downloaded as well as a record of errors or other download problems. This file may be deleted at any time; new data will be appended when the file already exists.

- e) Phone number. If the program is to be connected to the LD870 via a telephone and modem connection, the phone number must be entered on the command line. The phone number must be preceded by the characters "PH:" (without the quotes). If the phone number is not included on the command line or if there is no command line input, the program will attempt a direct serial port connection. If a modem connection is used, the LD870 setup parameter #154 must be set to "YES". For a cellular phone connection, the phone number string must contain the character "Y" which triggers the program to set several time out parameters to larger values. The Microcom modems currently used for cellular connections also require the "Y" or "JKY" at the end of the phone number for a cellular connection.

When a phone number is included on the command line, the program will attempt to dial the modem and log onto the LD870. If the first attempt to connect with the LD870 is unsuccessful, the program will redial up to four time at seventy-five second intervals. The seventy-five second delay should give the LD870 sufficient time to recycle and send the setup string to the modem. Also note that if a device I/O or time out error (or similar error) occurs during the LD870 logon process or during data transfer, the program may (depending on the error) attempt to redial a maximum of two times. To use the LD870 with a modem connection the LD870 Modem Mode parameter (S154) must be set to YES, the baud rate must be set to 2400 (parameter S9), and the Modem Setup String (parameter S158) must be set to "X4 E0 V0 Q0 S0=5". It might work best if the modem initializes to these settings. Note that the LD870 will not respond to a 9600 baud rate with a modem connection. A baud rate of 9600 can be used for a direct serial port connection.

Note that the first two characters of the "S5" Title parameter which is set up in the LD870SET.Sxx file must contain the two character LD870 site code. The remaining 28 characters can be used as needed. This site code is used by the LD870M program to define the report file names as described in this documentation file.

The LD870 setup file will be required to setup/initialize the LD870 for data collection. This setup file is not required if only the LD870 data histories are cleared. This setup file may need to be updated using any convenient editor each time it is used to reset the LD870 setup parameters. Note that the format of the setup file must be a string variable in double quotes followed by a comment which starts with a single quote. The LD870 data histories can be reset using the "M8" command; thus the entire reset option may not be required on a regular basis. This LD870 setup file and the LD870M program are designed to run with LD870 firmware version 0.835 dated 05 Mar 1992.

The LD870SET.Sxx file must contain one record for each "S" parameter. Each record must contain only one "S" parameter and one comment string. The "S" parameter with the selected option must be enclosed in double quotes and the comment must be preceded by a single quote (e.g., "S66,1" 'Excd History Enable). No commas are permitted in the comment section. There is no set length for either part. The syntax of the "S" parameter must be as described in the LD870 Manual (or LD820 Manual) except that the version of the command using the semicolon and brackets (e.g., S66:[Yes]) would not work with the LD820's used to check out this program; this format worked just fine with the LD870's. Note that the current date and time are not setup from this file; these parameters are taken from the computer.

The "delay!" variable, which is used in numerous pause calls throughout the program, is currently set to 0.6 seconds if the LD870 is not in modem mode and to 1.5 seconds when the LD870 is in modem mode. The modem mode parameter as used here is set to "YES" if a phone number is read from the command line; otherwise it is set to "NO". These two delay times appear to work very well in direct connect mode at 9600 baud and in modem mode at 2400 baud. There are also many calls to the PAUSE routine where other delay times are used for that specific call. Many of these PAUSE times have not been fine tuned and may be larger than necessary for this latest version of the LD870 firmware. The LD870 has worked very well with the current settings.

In May 1992, the LD870 was tested with a cellular phone and cellular modem connection. Since the cellular phones/modems may frequently give no response for as long as several seconds, the LD870 program timed out in numerous time out loops in the "transfer" and "read.LD870" routines. To avoid this time out problem, a "read.timeout!" variable was added to the program and the time out loops were changed to measure a specific time in seconds. This also eliminated the variations due to computer speed. Variables "read.timeout.sec.init!" and "read.timeout.sec!" were added to the program to set the "read.timeout!" variable for the program initialization phase and for the regular operation of the program. A long time out during the baud rate selection did not work properly. A "read.timeout!" of 0.4 seconds appears to work fine for a regular phone/modem or direct line connection. For a cellular phone/modem connection, 1.3 seconds during initialization and five to six seconds during normal operation appear to work okay (this may need additional fine tuning). As of February 1996, the program checks the phone number string for a "Y" or "y" and if found assumes a cellular connection and sets the above parameters accordingly. Cellular phone numbers used with the Microcom modems should include "JKY" or "Y" as the last character(s) in the phone number.

This menu driven version of the LD870 program displays regular text menus using upper ASCII code characters to draw the lines and boxes. There are no graphics calls and all displays are in 80 characters per line mode.

When the transfer option (2) is selected from the main menu, this LD870M program presents a Transfer Choices menu in which option (4) is "Transfer EXCD, INTV and SUMmary Reports". This option will download these three reports by chaining to program LD870_DL which is the auto-download version of the LD870 program. This option (4) will also permit the operator to set a data history reset flag which will reset the data histories if the downloads are successful. Note that the LD870 setup file (LD870SET.Snn) is not required for this data history reset option. The CHAIN command will not permit command line options; thus, the EXC, INT, SUM and

RST flags are set and carried to the LD870_DL program via blank COMMON. After the download is complete, the LD870_DL program chains back to the menu driven LD870M program. Note that the selection of option (4) from the transfer menu is the only time the two programs chain from the LD870M to the LD870_DL and back to the LD870M. This Transfer Choices menu also provides the option to set the transfer mode to formatted or unformatted. Formatted data can be sent to a printer and are easy to read because data variables are identified. Unformatted data are downloaded with one record per interval or one record per exceedance. Unformatted data are comma delimited and thus ideal for entry into a spreadsheet. The variable sequence in the unformatted records for a specific report will vary depending on the parameters set in the LD870 (for example, weather data versus no weather data or wind monitor versus no wind monitor, etc.). The easiest and maybe the only way to determine the location of variables in the unformatted records is to compare several formatted and unformatted records. Note that the Daily Noise History report can't be downloaded in unformatted mode for LD870's with firmware version 0.835 dated 05 March 1992. Unformatted data are in a spreadsheet compatible format for LD870's with firmware version 0.840 or later. Unformatted data for earlier firmware versions are downloaded with one variable per record or line.

The use of the CHAIN command and the sharing of blank COMMON between the LD870M and LD870_DL programs can be done only when the two programs are compiled using the QuickBASIC option where the EXE files require the BRUN45.EXE file. The stand-alone EXE files will not carry COMMON variables between the two programs. Thus the BRUN45.EXE file must be in the subdirectory with the EXE files or on the DOS path. If the chaining is never used, the programs may be compiled in the stand-alone mode.

In summary, the files required to execute the LD870M program are:

LD870SET.Snn -- LD870 setup data file (nn is site number). File LD870SET.DAT is a second default if file LD870SET.Snn is not found. This file is required only if the initialize option is selected from the main menu.

LD870M.EXE -- LD870 executable

LD870_DL.EXE -- LD870 auto-download executable; required only if Option 4 is selected from the Transfer Choices menu.

BRUN45.EXE -- QuickBASIC file required with above EXE's. File must be in the above subdirectory or on the path.

To run and/or compile the LD870M.BAS program in the QuickBASIC environment the following files are required:

QBB_LIBM.BAT -- loads the LD870M.BAS program and libraries

LD870LIB.LIB -- LD870 QuickBASIC library

LD870LIB.QLB -- LD870 QuickBASIC library

LD870M.BAS -- LD870 source file

LD870SET.Snn -- LD870 setup data file ("nn" is site number); see above comments.

This LD870M program together with the LD870_DL program will download six different types of reports or data histories. The report names and standard file names are listed below:

- a) The Daily Noise History Report is downloaded to file SnnDNH.Dxx where "nn" is the site number and "xx" is the sequence code for multiple files.
- b) The Exceedance Report is downloaded to file SnnEXC.Dxx.
- c) The Run/Stop and Cal Log Report is downloaded to file SnnRCL.Dxx.
- d) The Interval Report is downloaded to file SnnINT.Dxx.
- e) The Summary Report is downloaded to file SnnSUM.Dxx.

- f) The User Specified or Customized Report is downloaded to file SnnURPT.Dxx.

Some additional information may be included in the comments at the beginning of the LD870M.BAS program.

Brief Comments Concerning the LD870M Program

The LD870M.BAS program is the standard menu driven version of the LD870 control program which can be used to set up or reset the LD870 and/or download files from the LD870. When the program is used to set up or reset the LD870, the setup parameters must be stored in a setup file. Each record/line in the LD870 setup file must contain one setup parameter enclosed in double quotes followed by a comment which starts with a single quote; no commas are permitted in the comment section. The setup file name can be entered on the command line unless the default file name is accepted. If there is no command line input or if the setup file name is not entered on the command line, the default setup file name is LD870SET.Snn where "nn" is the LD870 site number. Note that if the default (LD870SET.Snn) and/or command line LD870 setup file is not found, the program will attempt to use file LD870SET.DAT as a second default. This setup file may need to be updated using any convenient editor each time it is used to reset the LD870 setup parameters. The LD870 data histories can be reset using the "M8" command; thus the entire reset option may not be required on a regular basis. This LD870 setup file and the LD870M program are designed to run with LD870 firmware version 0.835 dated 05 Mar 1992.

When the transfer option (2) is selected from the main menu, this LD870M program presents a Transfer Choices menu in which option (4) is "Transfer EXCD, INTV and SUMmary Reports". This option will download these three reports by chaining to program LD870_DL which is the auto-download version of the LD870 program. This option (4) will also permit the operator to set a data history reset flag which will reset the data histories if the downloads are successful. This Transfer Choices menu also provides the option to download formatted or unformatted data.

The Daily Noise History report can't be downloaded in unformatted mode. Unformatted data are in a spreadsheet compatible format for LD870's with firmware version 0.840 or later. Unformatted data for earlier firmware versions are downloaded with one variable per record or line.

File SnnLOG.DAT is an output file written to the current subdirectory by the LD870_DL program where "nn" is the LD870 site number; this is the default file name. If this default file name is not acceptable, this output log file name may be entered from the command line as described below (see command line input). One SnnLOG.DAT file will be written for each site from which data are downloaded. This file serves as a log of download operations. It will contain a list of all files downloaded as well as a record of errors or other download problems. This file may be deleted at any time; new data will be appended when the file already exists.

The five optional command line input parameters for this LD870M.BAS program are the following:

- a) LD870 site number. If command line input is used, the site number must be the first two characters on the command line. The site number may be alphanumeric.
- b) COM port name. The COM port name must be included if something other than the default "COM1:" is used. The COM port entry must be COM1:, COM2:, COM3:, or COM4:.
- c) LD870 setup file name. If command line input is used and the setup file name is not entered, the default file name is LD870SET.Snn where "nn" is the site number entered on the command line. If this setup file name is entered on the command line, the file name must be preceded by the characters "SU:" (without the quotes). If there is no command line input, the default setup file name is LD870SET.Snn where "nn" is the site number read from the LD870 using the "Q5" query parameter. The file name entered on the command line may include the DOS path as part of the file name when the path is needed to

find the file. Note that if the default (LD870SET.Snn) and/or command line LD870 setup file is not found, the program will attempt to use file LD870SET.DAT as a second default.

- d) LD870 output/log file name. This log file name must be preceded by the characters "LF:" (without the quotes). If this output/log file name is not included on the command line, the default file name is of the form SnnLOG.DAT where "nn" is the site number entered on the command line. This output/log file name is not used by this LD870M.BAS program unless this program executes the LD870_DL.BAS program using the BASIC "CHAIN" command. The LD870_DL.BAS download program appends download information to this file. If there is no command line input, the default output/log file name is SnnLOG.DAT where "nn" is read from the LD870 using "Q5" query parameter. This file name may also include the DOS path as needed.
- e) Phone number. If the program is to be connected to the LD870 via a telephone and modem connection, the phone number must be entered on the command line. The phone number must be preceded by the characters "PH:" (without the quotes). If the phone number is not included on the command line or if there is no command line input, the program will attempt a direct hard wire connection. If a modem connection is used, the LD870 setup parameter #154 must be set to "YES". For a cellular phone connection, the phone number string must contain the character "Y" which triggers the program to set several time out parameters to larger values.

When a phone number is included on the command line, the program will make a maximum of four attempts to connect with the modem before aborting the job. If a device I/O or time out error (or similar error) occurs during the dial in process or during data transfer, the program may (depending on the error) attempt to redial a maximum of two times.

The following sample command line input contains all the parameters described above. Each parameter on the command line must be separated by a space including a space after the LD870M executable file name. This entire command line input is optional and is required only when one or more default parameters do not apply. Note that if the command line is used, the site number must be included and must be the first two characters after the executable file name; all other parameters may be entered in any sequence. The maximum length of the command line is 128 characters excluding the program file name (LD870M in this example):

LD870M 07 COM1: SU:LD870SET.S07 LF:S07LOG.DAT PH:9,476-7874

Brief Comments Concerning the LD820M Program

The LD820M.BAS program is the standard menu driven version of the LD820 control program which can be used to set up or reset the LD820 and/or download files from the LD820. When the program is used to set up or reset the LD820, the setup parameters must be stored in a setup file. Each record/line in the LD870 setup file must contain one setup parameter enclosed in double quotes followed by a comment which starts with a single quote; no commas are permitted in the comment section. The setup file name can be entered on the command line unless the default file name is accepted. If there is no command line input or if the setup file name is not entered on the command line, the default setup file name is LD820SET.Snn where "nn" is the LD820 site number. Note that if the default (LD820SET.Snn) and/or command line LD820 setup file is not found, the program will attempt to use file LD820SET.DAT as a second default. This setup file may need to be updated using any convenient editor each time it is used to reset the LD820 setup parameters. The LD820 data histories can be reset using the "M8" command; thus the entire reset option may not be required on a regular basis. This LD820 setup file and the LD820M program are designed to run with LD820 firmware revision 0.145 dated 04 Dec 1992.

When the transfer option (2) is selected from the main menu, this LD820M program presents a Transfer Choices menu in which option (4) is "Transfer EXCD,

INTV and SUMmary Reports". This option will download these three reports by chaining to program LD820_DL which is the auto-download version of the LD820 program. This option (4) will also permit the operator to set a data history reset flag which will reset the data histories if the downloads are successful. This Transfer Choices menu also provides the option to download formatted or unformatted data. Unformatted data are downloaded in a spreadsheet compatible comma delimited format.

File SnnLOG.DAT is an output file written to the current subdirectory by the LD820_DL program where "nn" is the LD820 site number; this is the default file name. If this default file name is not acceptable, this output log file name may be entered from the command line as described below (see command line input). One SnnLOG.DAT file will be written for each site from which data are downloaded. This file serves as a log of download operations. It will contain a list of all files downloaded as well as a record of errors or other download problems. This file may be deleted at any time; new data will be appended when the file already exists.

The five optional command line input parameters for this LD820M.BAS program are the following:

- a) LD820 site number. If command line input is used, the site number must be the first two characters on the command line. The site number may be alphanumeric.
- b) COM port name. The COM port name must be included if something other than the default "COM1:" is used. The COM port entry must be COM1:, COM2:, COM3:, or COM4:.
- c) LD820 setup file name. If command line input is used and the setup file name is not entered, the default file name is LD820SET.Snn where "nn" is the site number entered on the command line. If this setup file name is entered on the command line, the file name must be preceded by the characters "SU:" (without the quotes). If there is no command line input, the default setup file

name is LD820SET.Snn where "nn" is the site number read from the LD820 using the "Q5" query parameter. The file name entered on the command line may include the DOS path as part of the file name when the path is needed to find the file. Note that if the default (LD820SET.Snn) and/or command line LD870 setup file is not found, the program will attempt to use file LD820SET.DAT as a second

- d) LD820 output/log file name. This log file name must be preceded by the characters "LF:" (without the quotes). If this output/log file name is not included on the command line, the default file name is of the form SnnLOG.DAT where "nn" is the site number entered on the command line. This output/log file name is not used by this LD820M.BAS program unless this program executes the LD820_DL.BAS program using the BASIC "CHAIN" command. The LD820_DL.BAS download program appends download information to this file. If there is no command line input, the default output/log file name is SnnLOG.DAT where "nn" is read from the LD820 using "Q5" query parameter. This file name may also include the DOS path as needed.
- e) Phone number. If the program is to be connected to the LD820 via a telephone and modem connection, the phone number must be entered on the command line. The phone number must be preceded by the characters "PH:" (without the quotes). If the phone number is not included on the command line or if there is no command line input, the program will attempt a direct hard wire connection. Note that the LD820 modem mode setup parameter #154 must always be set to "NO"; the current LD820's in the AL/OEBN inventory do not work with modem mode set to "YES".

When a phone number is included on the command line, the program will make a maximum of four attempts to connect with the modem before aborting the job. If a device I/O or time out error (or similar error) occurs during the dial in process or

during data transfer, the program may (depending on the error) attempt to redial a maximum of two times.

The following sample command line input contains all the parameters described above. Each parameter on the command line must be separated by a space including a space after the LD820M executable file name. This entire command line input is optional and is required only when one or more default parameters do not apply. Note that if the command line is used, the site number must be included and must be the first two characters after the executable file name; all other parameters may be entered in any sequence. The maximum length of the command line is 128 characters excluding the program file name (LD820M in this example):

LD820M 07 COM1: SU:LD820SET.D07 LF:S07LOG.DAT PH:9,476-7874

APPENDIX II

SAMPLE NOISECHECK II FORMATTED FILES

EXCEEDANCE DATA

E0160210.EXC

Site: 01 Model: 870

SN: 870A0174 Download Date 10Feb1996 Time 05:26:34

 870A0174 Download Date 11Feb1996 Time 05:22:48

| Cnt | Date | Time | Duration | Leq | Lmax | Peak | Uwpk | SEL | EXCD | OVL | Dir | Gust |
|-----|-----------|----------|----------|------|-------|-------|-------|-------|------|-----|-----|------|
| 77 | 10Feb1996 | 01:40:33 | 00:19.06 | 65.8 | 68.1 | 79.8 | 97.8 | 78.6 | 0 | 0 | N | 0.0 |
| 0 | 10Feb1996 | 05:43:21 | 00:26.71 | 65.3 | 69.0 | 82.1 | 100.8 | 79.5 | 0 | 0 | W | 8.0 |
| 2 | 10Feb1996 | 05:58:40 | 00:28.78 | 66.8 | 70.0 | 83.3 | 106.8 | 81.4 | 0 | 0 | W | 10.1 |
| 3 | 10Feb1996 | 06:05:56 | 00:31.28 | 66.0 | 68.9 | 88.4 | 100.4 | 80.9 | 0 | 0 | W | 8.9 |
| 4 | 10Feb1996 | 06:46:44 | 00:55.40 | 89.5 | 99.0 | 113.3 | 117.0 | 106.9 | 0 | 0 | WNW | 5.3 |
| 5 | 10Feb1996 | 08:19:11 | 01:29.25 | 94.1 | 104.6 | 123.8 | 126.3 | 113.6 | 0 | 0 | W | 10.3 |

EXCEEDANCE DATA

E0260211.EXC

Site: 02 Model: 820

SN: 820A0439 Download Date 12Feb1996 Time 05:13:20

| Cnt | Date | Time | Duration | Leq | Lmax | Peak | Uwpk | SEL | EXCD | OVL |
|-----|-----------|----------|----------|------|------|-------|-------|------|------|-----|
| 1 | 11Feb1996 | 15:19:49 | 00:29.06 | 80.0 | 87.8 | 102.1 | 102.7 | 94.7 | 0 | 0 |
| 2 | 11Feb1996 | 15:20:20 | 00:13.40 | 77.8 | 84.3 | 102.1 | 100.2 | 89.1 | 0 | 0 |
| 3 | 11Feb1996 | 15:21:30 | 00:32.68 | 75.3 | 82.1 | 103.4 | 100.2 | 90.4 | 0 | 0 |
| 4 | 11Feb1996 | 15:22:42 | 00:10.00 | 71.3 | 80.3 | 98.4 | 0.0 | 81.3 | 0 | 0 |
| 5 | 11Feb1996 | 15:23:41 | 00:12.00 | 71.9 | 78.7 | 94.1 | 0.0 | 82.7 | 0 | 0 |

INTERVAL DATA

I0160210.INT

Site: 01 Model: 870

SN: 870A0174 Download Date 10Feb1996 Time 05:25:28

870A0174 Download Date 11Feb1996 Time 05:21:33

| Cnt | Date | Time | Duration | Leq | Lmin | Lmax | Peak | Uwpk | SEL | EXCD | Ovld | L01 | L10 | L33 | L50 | L90 | L99 | |
|-----|-----------|----------|----------|------|------|------|------|-------|------|------|------|------|------|------|------|------|------|------|
| 16 | 10Feb1996 | 00:00:00 | 1:00:00 | 47.3 | 41.0 | 63.6 | 91.9 | 127.6 | 82.9 | 0 | 0 | 56.7 | 48.6 | 46.6 | 46.3 | 45.5 | 43.8 | 42.0 |
| 17 | 10Feb1996 | 01:00:00 | 1:00:00 | 51.1 | 42.7 | 68.1 | 89.3 | 122.3 | 86.6 | 8 | 0 | 63.6 | 52.9 | 46.5 | 45.3 | 43.7 | 43.1 | 43.1 |
| 18 | 10Feb1996 | 02:00:00 | 1:00:00 | 47.0 | 42.6 | 63.6 | 87.3 | 116.9 | 82.6 | 0 | 0 | 57.4 | 49.3 | 45.8 | 45.0 | 43.6 | 43.1 | 43.1 |
| 19 | 10Feb1996 | 03:00:00 | 1:00:00 | 45.4 | 42.4 | 59.0 | 88.4 | 117.0 | 81.0 | 0 | 0 | 52.3 | 47.0 | 45.2 | 44.6 | 43.4 | 43.0 | 43.0 |
| 20 | 10Feb1996 | 04:00:00 | 1:00:00 | 48.4 | 42.9 | 74.9 | 92.4 | 126.0 | 84.0 | 1 | 0 | 56.6 | 51.1 | 46.6 | 45.7 | 44.1 | 43.1 | 43.1 |

WEATHER DATA

W0160206.WX

Site: 01 Model: 870

SN: 870A0174 Download Date 09Feb1996 Time 08:34:10

| Count | Date | Interval | Time | Wind | | | Temperature | | | Humidity | | |
|-------|-----------|----------|------|------|-------|-------|-------------|------|------|----------|------|------|
| | | | | Dir | Speed | Gusts | Avg | Min | Max | Avg | Min | Max |
| 0 | 06Feb1996 | 08:48:46 | | N | 0.0 | 0.0 | 8.5 | 8.5 | 9.0 | 78.0 | 78.0 | 78.5 |
| 1 | 06Feb1996 | 08:48:46 | | N | 0.0 | 0.0 | 8.5 | 8.5 | 9.0 | 78.0 | 78.0 | 78.5 |
| 2 | 06Feb1996 | 08:50:59 | | N | 0.0 | 0.0 | 9.5 | 9.0 | 10.5 | 76.5 | 74.5 | 78.5 |
| 3 | 06Feb1996 | 09:00:00 | | SW | 1.5 | 4.2 | 14.0 | 10.0 | 17.0 | 68.0 | 64.5 | 75.5 |
| 4 | 06Feb1996 | 10:00:00 | | S | 3.0 | 7.8 | 19.5 | 16.5 | 22.5 | 55.5 | 50.5 | 65.0 |
| 5 | 06Feb1996 | 11:00:00 | | SW | 5.3 | 10.7 | 24.0 | 21.5 | 26.0 | 47.0 | 43.5 | 52.5 |

APPENDIX III SAMPLE NOISENET REPORTS

Exceedance Report

Field Demonstration

Current Date:04/18/96 Time:11:05:26

Site:01 SN:0 OEBN_Trailer

Address:

:Bart_Elias

:2610_7th_Street

:WPAFB_Ohio

Owner Phone 255-3675

Modem 9-286-3686Y

Start Date:02/05/96 End Date:02/16/96

Field Demonstration at WPAFB

| Cnt | Date | Time | Duration | SN: | LEQ | Lmax | Peak | UwPk | SEL | EXCD | OVL |
|-----|-----------|----------|----------|----------|------|------|------|------|------|------|-----|
| 0 | 06Feb1996 | 08:51:07 | 00:13.71 | 870A0174 | 70.4 | 74.8 | 86.1 | 92.1 | 81.8 | 0 | 0 |
| 1 | 06Feb1996 | 08:51:07 | 00:13.71 | 870A0174 | 70.4 | 74.8 | 86.1 | 92.1 | 81.8 | 0 | 0 |
| 2 | 06Feb1996 | 08:54:31 | 00:11.56 | 870A0174 | 68.6 | 72.6 | 83.3 | 88.2 | 79.2 | 0 | 0 |
| 3 | 06Feb1996 | 08:58:19 | 00:10.12 | 870A0174 | 68.8 | 72.2 | 82.4 | 91.7 | 78.8 | 0 | 0 |
| 4 | 06Feb1996 | 09:05:25 | 00:11.90 | 870A0174 | 67.8 | 71.8 | 83.1 | 87.9 | 78.5 | 0 | 0 |
| 5 | 06Feb1996 | 09:08:40 | 00:11.09 | 870A0174 | 71.0 | 74.8 | 86.8 | 93.8 | 81.4 | 0 | 0 |

Interval Report

Field Demonstration

Current Date:04/18/96 Time:11:06:50

Site:01 SN:0 OEEN_Trailer

Address:

:Bart_Elias

:2610_7th_Street

:WPAFB_Ohio

Owner Phone 255-3675

Modem 9-286-3686Y

Start Date:02/05/96 End Date:02/16/96

Field Demonstration at WPAFB

| Cnt | Date | Time | Duration | SN: | LEQ | Lmin | Lmax | Peak | UwPk | SEL |
|-----|-----------|----------|----------|----------|------|------|------|-------|-------|-------|
| 0 | 06Feb1996 | 08:48:46 | 00:04.50 | 870A0174 | 49.7 | 48.1 | 51.7 | 62.6 | 78.4 | 56.2 |
| 1 | 06Feb1996 | 08:48:46 | 00:04.50 | 870A0174 | 49.7 | 48.1 | 51.7 | 62.6 | 78.4 | 56.2 |
| 2 | 06Feb1996 | 08:50:59 | 09:00.53 | 870A0174 | 58.5 | 45.1 | 74.8 | 86.1 | 92.1 | 85.8 |
| 3 | 06Feb1996 | 09:00:00 | 1:00:00 | 870A0174 | 55.7 | 40.6 | 79.4 | 91.1 | 97.3 | 91.3 |
| 4 | 06Feb1996 | 10:00:00 | 1:00:00 | 870A0174 | 72.1 | 38.9 | 97.5 | 108.9 | 115.5 | 107.7 |
| 5 | 06Feb1996 | 11:00:00 | 1:00:00 | 870A0174 | 72.3 | 39.9 | 95.7 | 108.2 | 114.9 | 107.8 |

Noise Net Summary Noise Report

Hourly Noise Report

Daily Noise Report

Field Demonstration

Current Date:04/18/96 Time:11:07:18

Site:01 SN:0 OEEN_Trailer

Address:

:Bart_Elias

:2610_7th_Street

:WPAFB_Ohio

Owner Phone 255-3675

Modem 9-286-3686Y

Start Date:02/05/96 End Date:02/16/96

Field Demonstration at WPAFB

Daily Noise Report

| Date | Time | I_Exc | I_LEQ | I_LDN | I_CNEL | Excd | E_LEQ | E_LDN | E_CNEL | H_LEQ | H_LDN | H_CNEL |
|----------|------|-------|-------|-------|--------|------|-------|-------|--------|-------|-------|--------|
| 02\06\96 | 1441 | 249 | 69.0 | 69.3 | 70.7 | 93 | 70.6 | 70.8 | 72.3 | -1.0 | -1.0 | -1.0 |
| 02\07\96 | 1440 | 1306 | 69.2 | 69.7 | 72.6 | 123 | 69.0 | 69.0 | 72.2 | -1.0 | -1.0 | -1.0 |
| 02\08\96 | 1440 | 1341 | 72.4 | 72.6 | 75.1 | 89 | 72.3 | 72.4 | 75.0 | -1.0 | -1.0 | -1.0 |
| 02\09\96 | 1652 | 1153 | 70.0 | 72.6 | 73.7 | 83 | 68.4 | 72.0 | 73.4 | -1.0 | -1.0 | -1.0 |
| 02\10\96 | 1778 | 964 | 70.8 | 73.1 | 73.3 | 464 | 71.6 | 73.7 | 73.9 | -1.0 | -1.0 | -1.0 |
| 02\11\96 | 1620 | 1223 | 70.0 | 74.2 | 74.2 | 753 | 70.1 | 73.4 | 73.4 | -1.0 | -1.0 | -1.0 |
| 02\12\96 | 1459 | 161 | 72.3 | 74.7 | 75.0 | 107 | 72.3 | 74.7 | 75.0 | -1.0 | -1.0 | -1.0 |
| 02\13\96 | 1778 | 225 | 68.5 | 69.0 | 69.6 | 159 | 69.3 | 69.4 | 70.1 | -1.0 | -1.0 | -1.0 |
| 02\14\96 | 1644 | 320 | 70.2 | 71.1 | 73.1 | 181 | 70.7 | 71.1 | 73.3 | -1.0 | -1.0 | -1.0 |
| 02\15\96 | 300 | 1 | 46.2 | 56.2 | 56.2 | 1 | 36.4 | 46.4 | 46.4 | -1.0 | -1.0 | -1.0 |

Hourly Noise Report

| Date | Hour | S_Time | Duration | I_Exc | I_Leq | I_SEL | Excd | E_Leq | E_SEL | HNL |
|----------|------|----------|----------|-------|-------|-------|------|-------|-------|------|
| 02\06\96 | 0 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 1 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 2 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 3 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 4 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 5 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 6 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 7 | 00:00:00 | 00:00:00 | 0 | -1.0 | -1.0 | 0 | -1.0 | -1.0 | -1.0 |
| | 8 | 08:48:46 | 09:10:33 | 3 | 58.4 | 85.8 | 4 | 51.1 | 86.6 | -1.0 |
| | 9 | 09:00:00 | 01:00:00 | 11 | 55.7 | 91.3 | 4 | 54.2 | 89.8 | -1.0 |
| | 10 | 10:00:00 | 01:00:00 | 14 | 72.1 | 107.7 | 6 | 72.1 | 107.6 | -1.0 |
| | 11 | 11:00:00 | 01:00:00 | 30 | 72.3 | 107.8 | 13 | 72.3 | 107.8 | -1.0 |
| | 12 | 12:00:00 | 01:00:00 | 25 | 72.9 | 108.4 | 9 | 72.8 | 108.4 | -1.0 |
| | 13 | 13:00:00 | 01:00:00 | 15 | 72.1 | 107.7 | 5 | 72.1 | 107.7 | -1.0 |
| | 14 | 14:00:00 | 01:00:00 | 47 | 72.0 | 107.6 | 12 | 71.9 | 107.5 | -1.0 |
| | 15 | 15:00:00 | 01:00:00 | 11 | 68.0 | 103.6 | 3 | 67.9 | 103.4 | -1.0 |
| | 16 | 16:00:00 | 01:00:00 | 8 | 53.2 | 88.7 | 1 | 41.6 | 77.2 | -1.0 |
| | 17 | 17:00:00 | 01:00:00 | 16 | 71.2 | 106.7 | 6 | 71.2 | 106.7 | -1.0 |
| | 18 | 18:00:00 | 01:00:00 | 16 | 76.3 | 111.8 | 12 | 76.2 | 111.8 | -1.0 |
| | 19 | 19:00:00 | 01:00:00 | 15 | 70.2 | 105.8 | 5 | 70.2 | 105.7 | -1.0 |
| | 20 | 20:00:00 | 01:00:00 | 14 | 71.2 | 106.8 | 7 | 71.1 | 106.7 | -1.0 |
| | 21 | 21:00:00 | 01:00:00 | 21 | 71.0 | 106.5 | 5 | 70.9 | 106.5 | -1.0 |
| | 22 | 22:00:00 | 01:00:00 | 3 | 61.4 | 96.9 | 1 | 61.0 | 96.6 | -1.0 |
| | 23 | 23:00:00 | 01:00:00 | 0 | 48.9 | 84.5 | 0 | 0.0 | 0.0 | -1.0 |

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